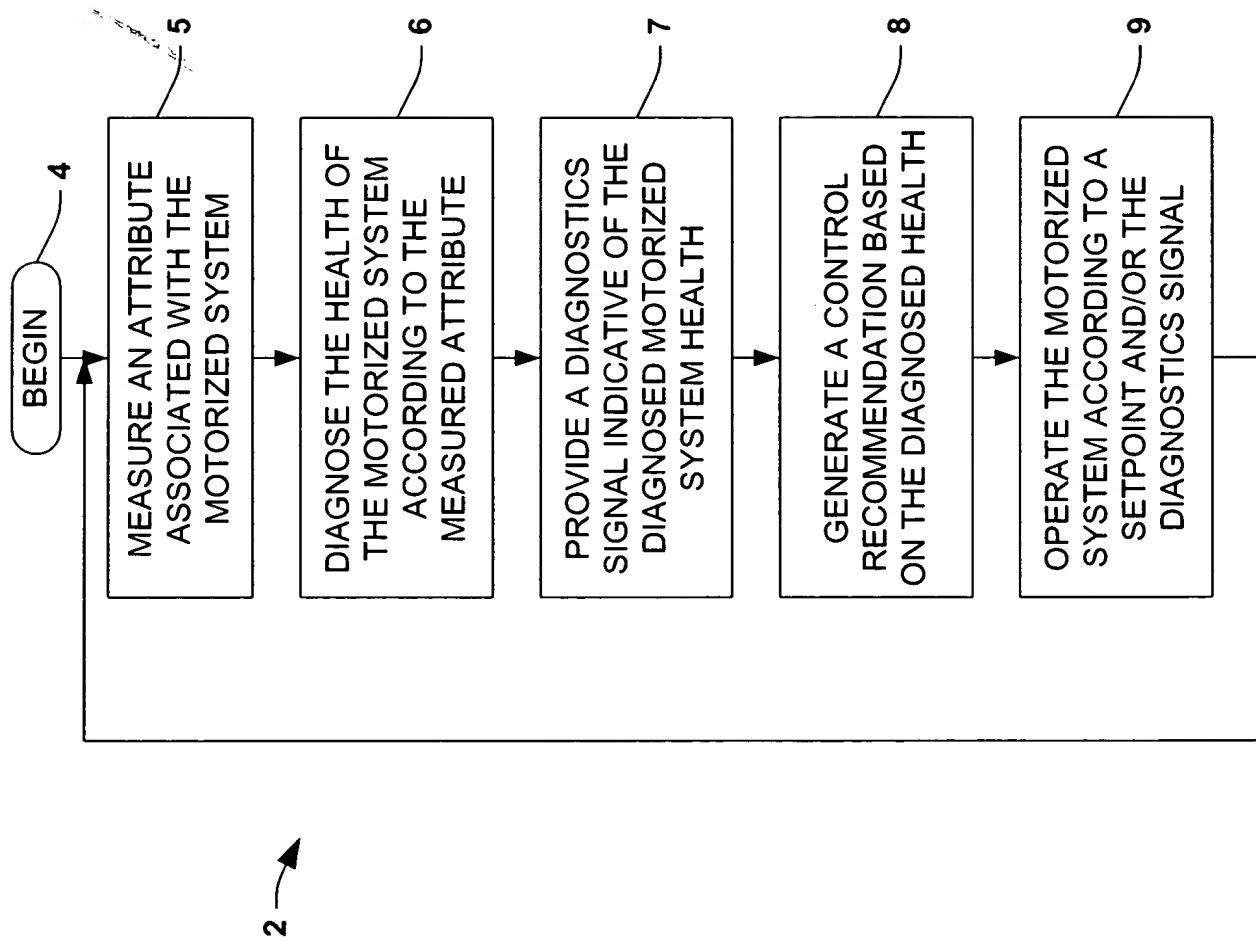
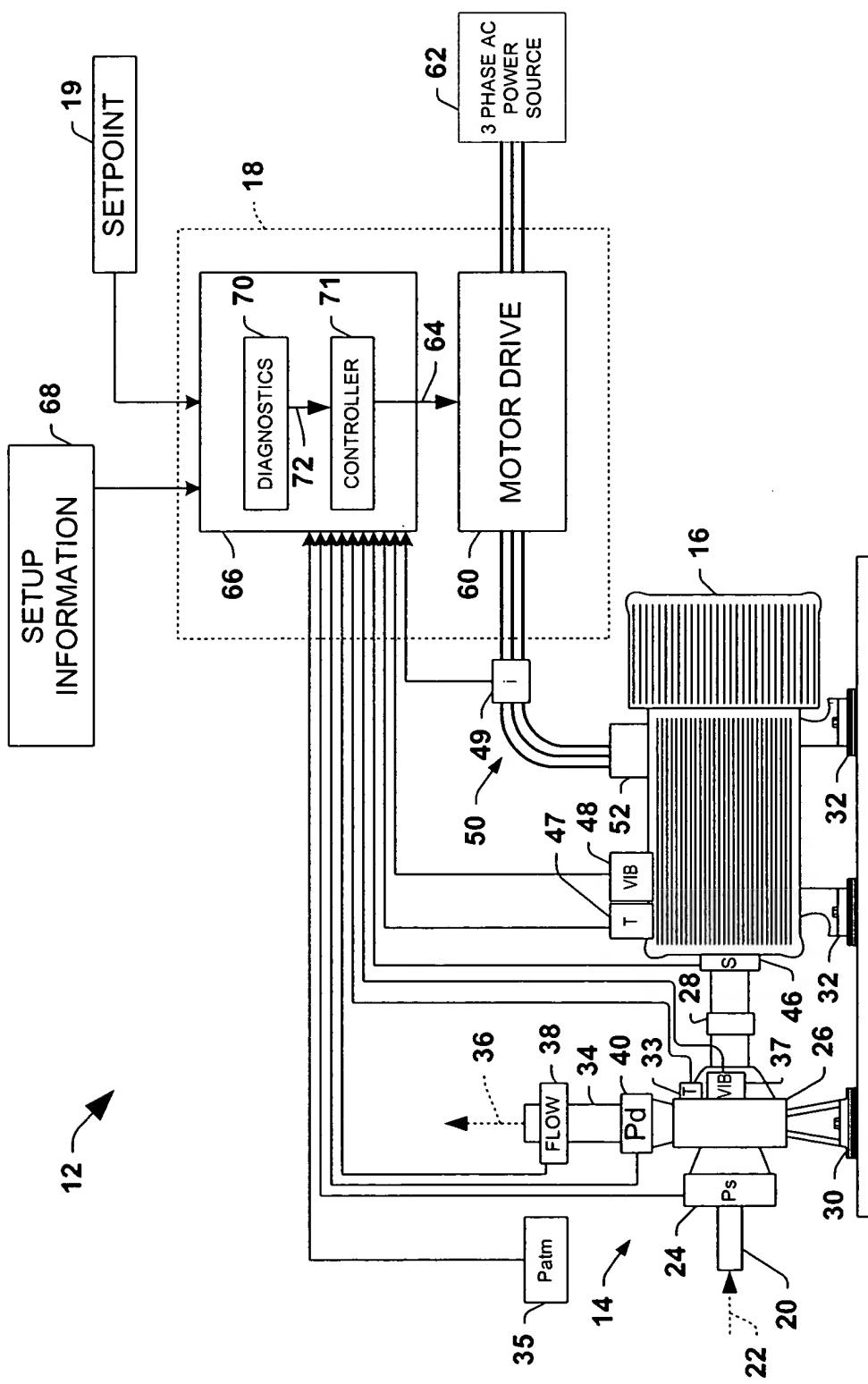


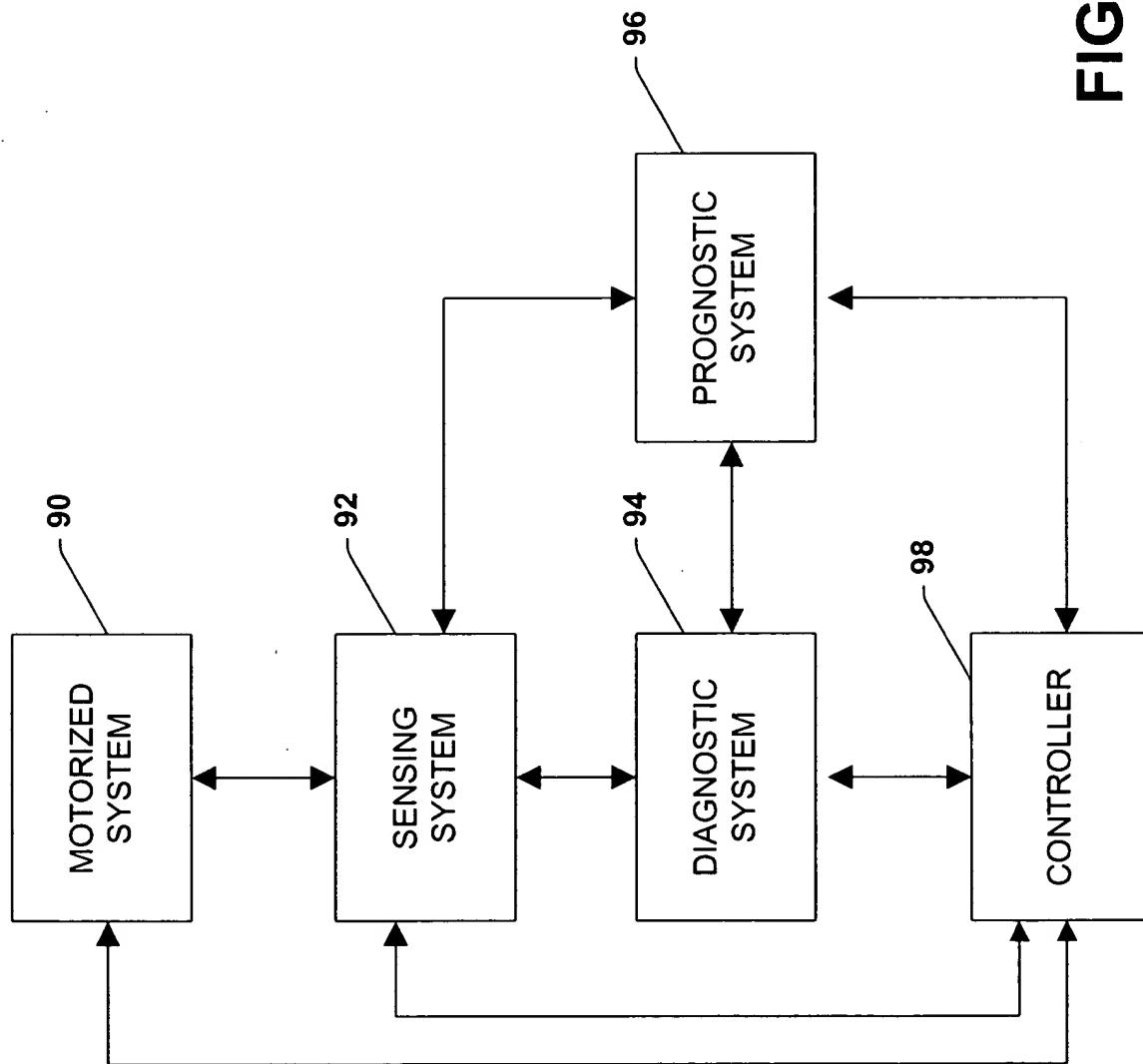
**FIG. 1**



**FIG. 2a**

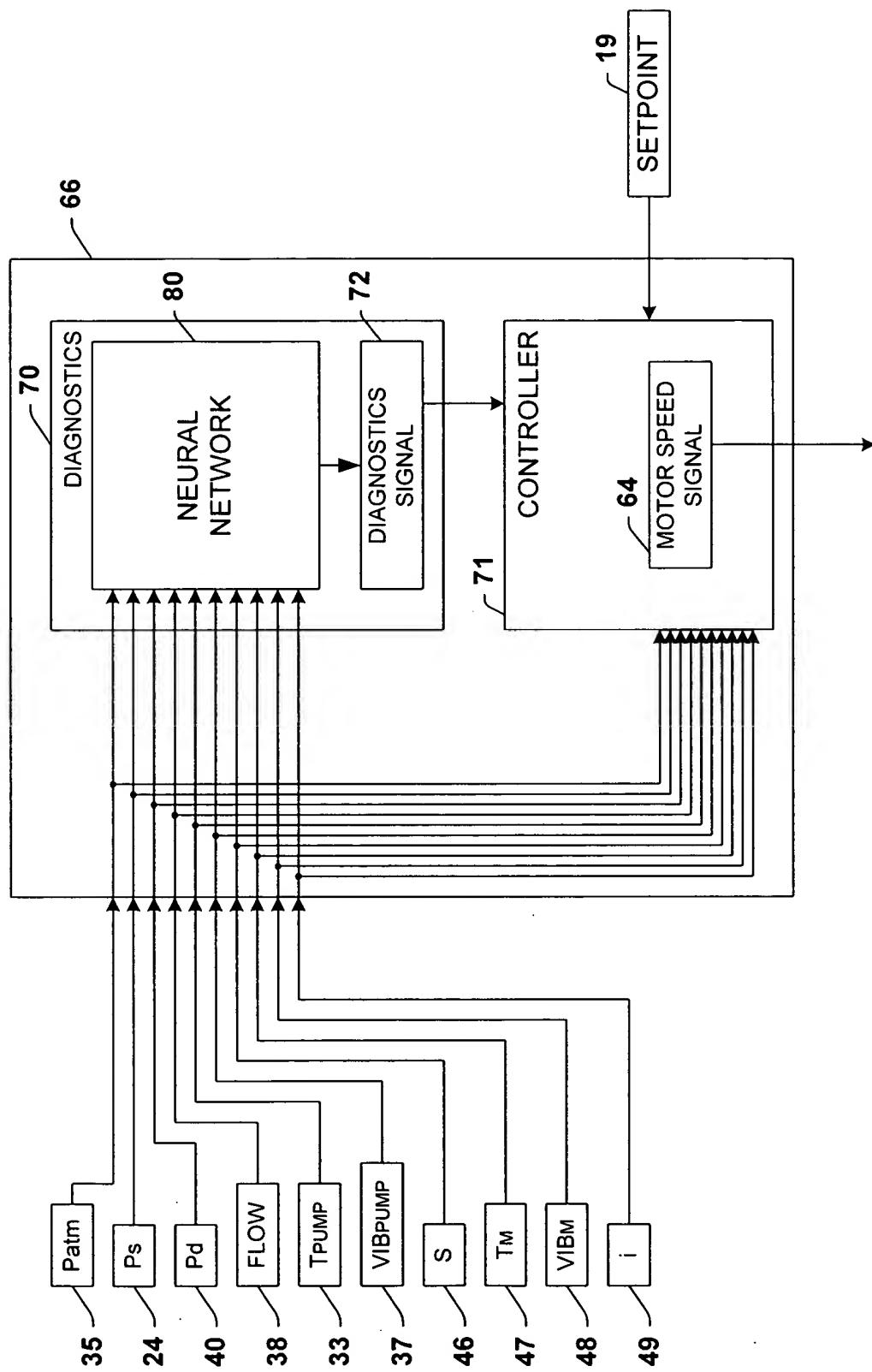


**FIG. 2b**

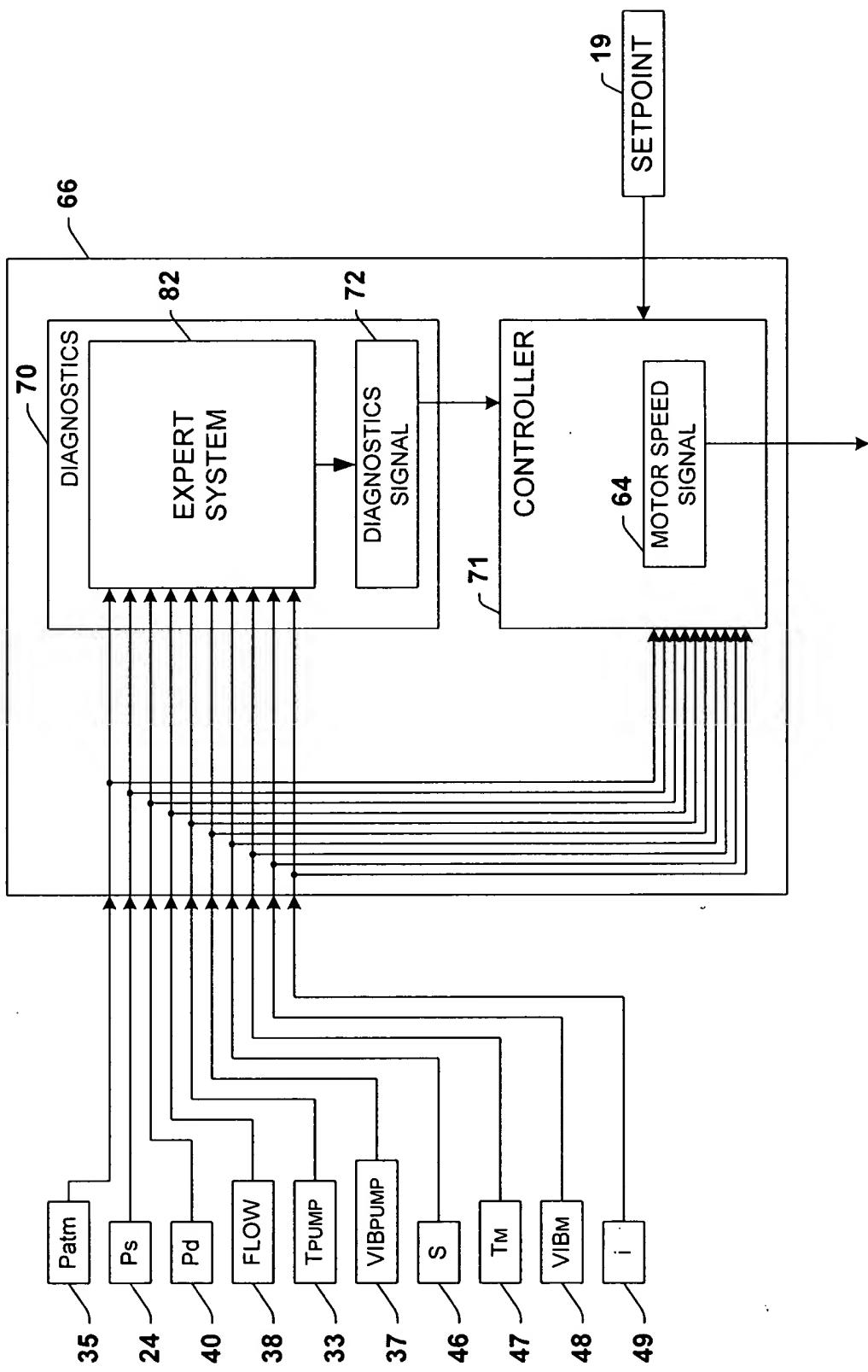


**FIG. 3**

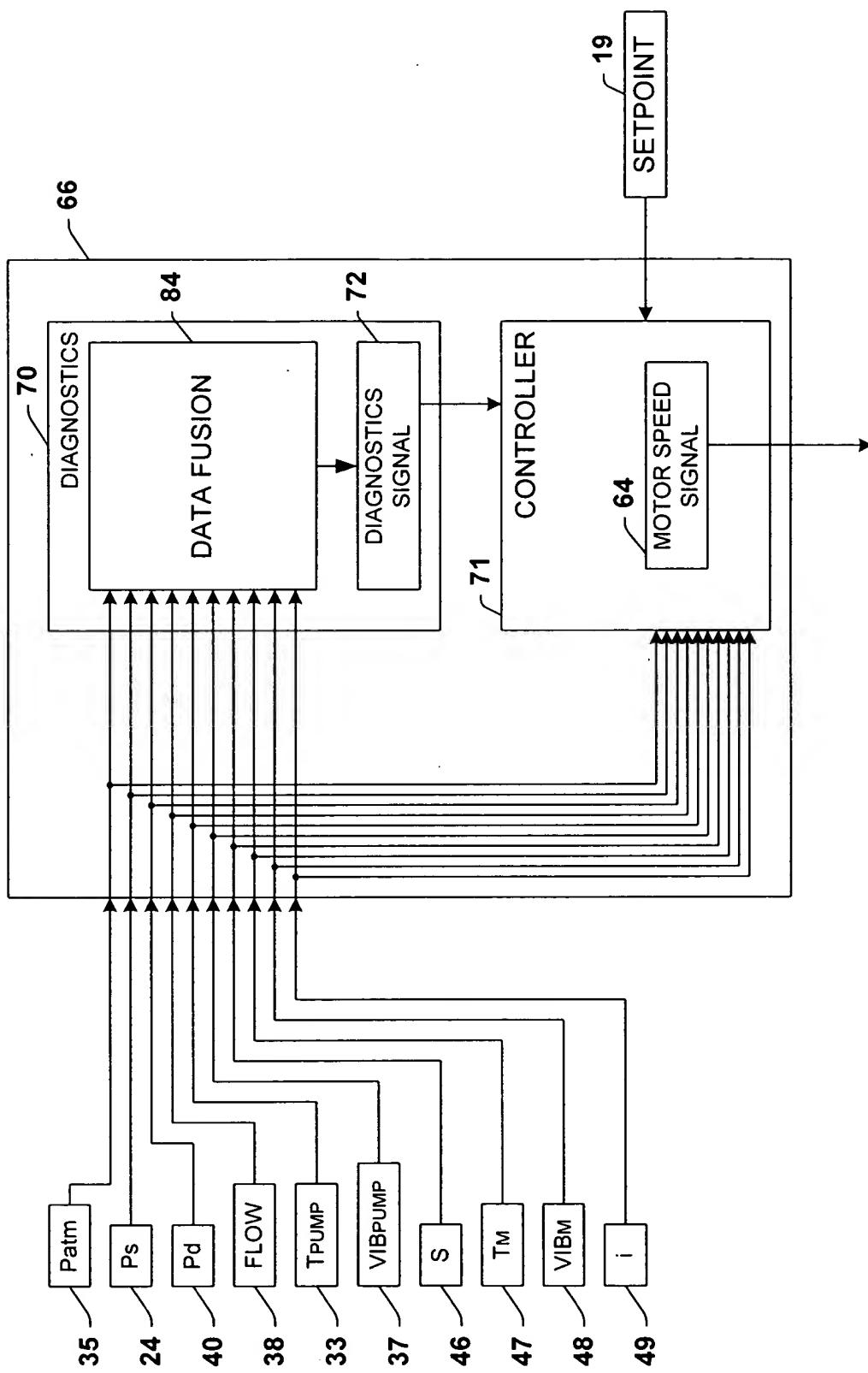
Patm  
Ps  
Pd  
FLOW  
TPUMP  
VIBPUMP  
S  
T<sub>M</sub>  
VIBM  
i



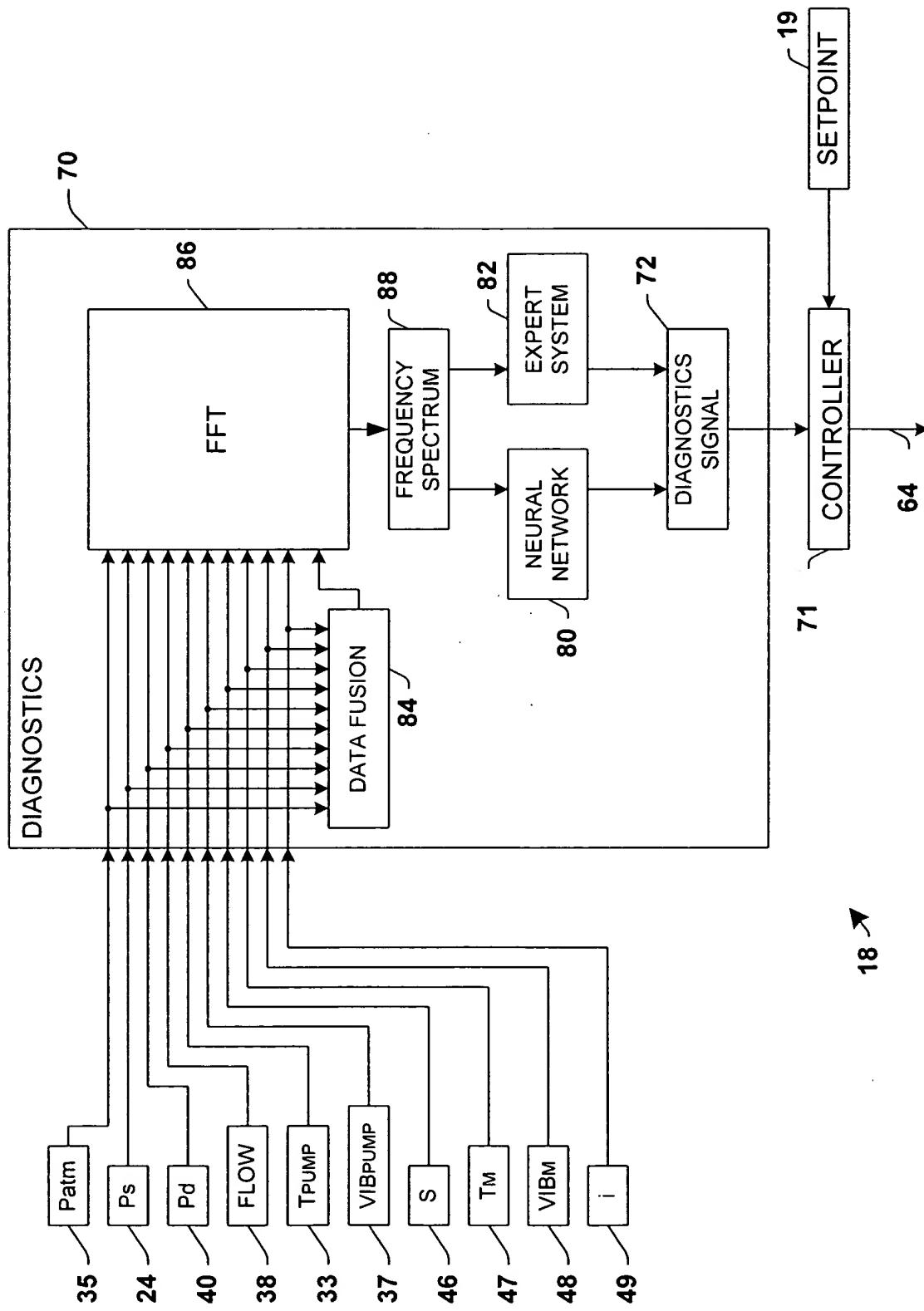
**FIG. 4**

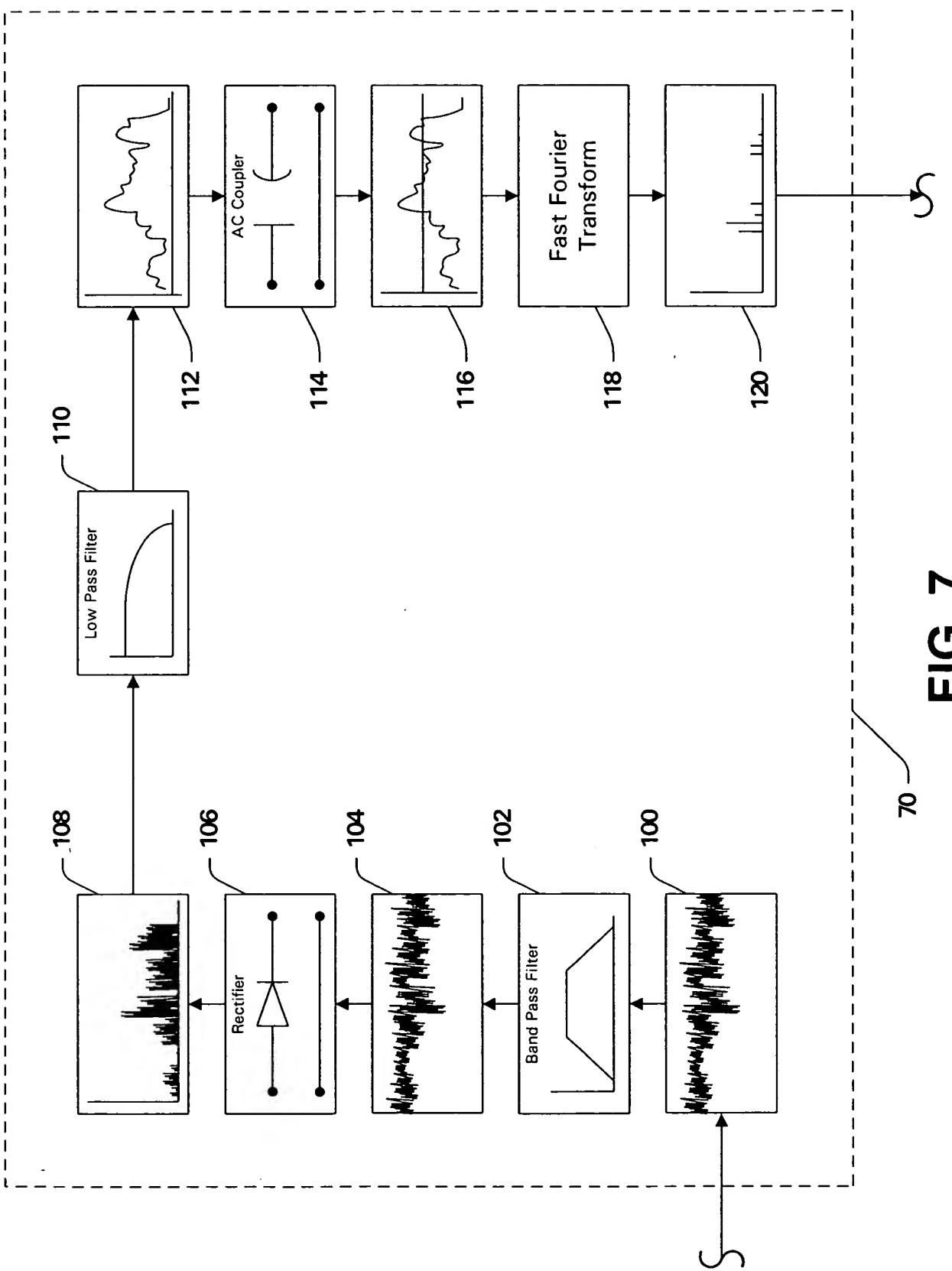


**FIG. 5**



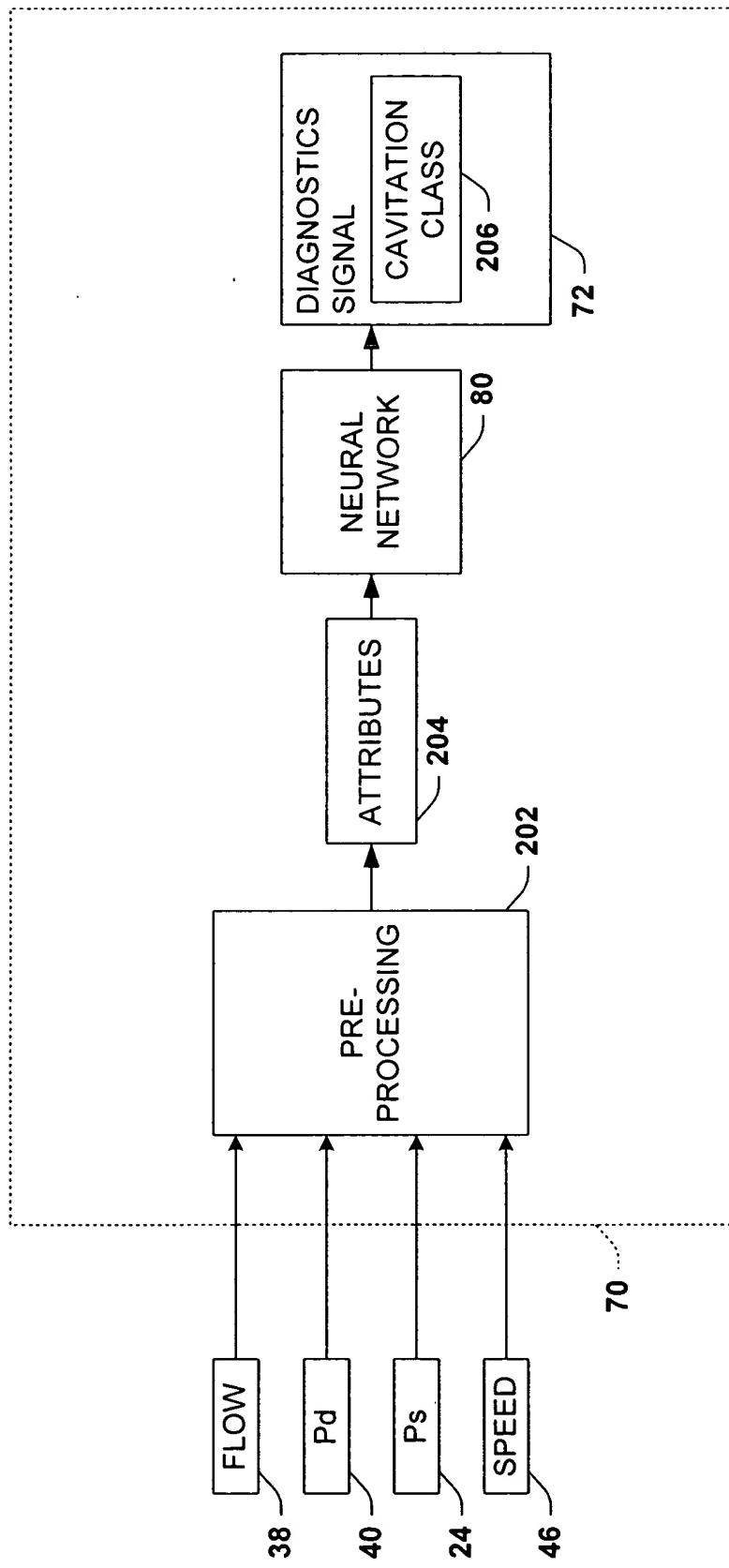
**FIG. 6**





**FIG. 7**

**FIG. 8**

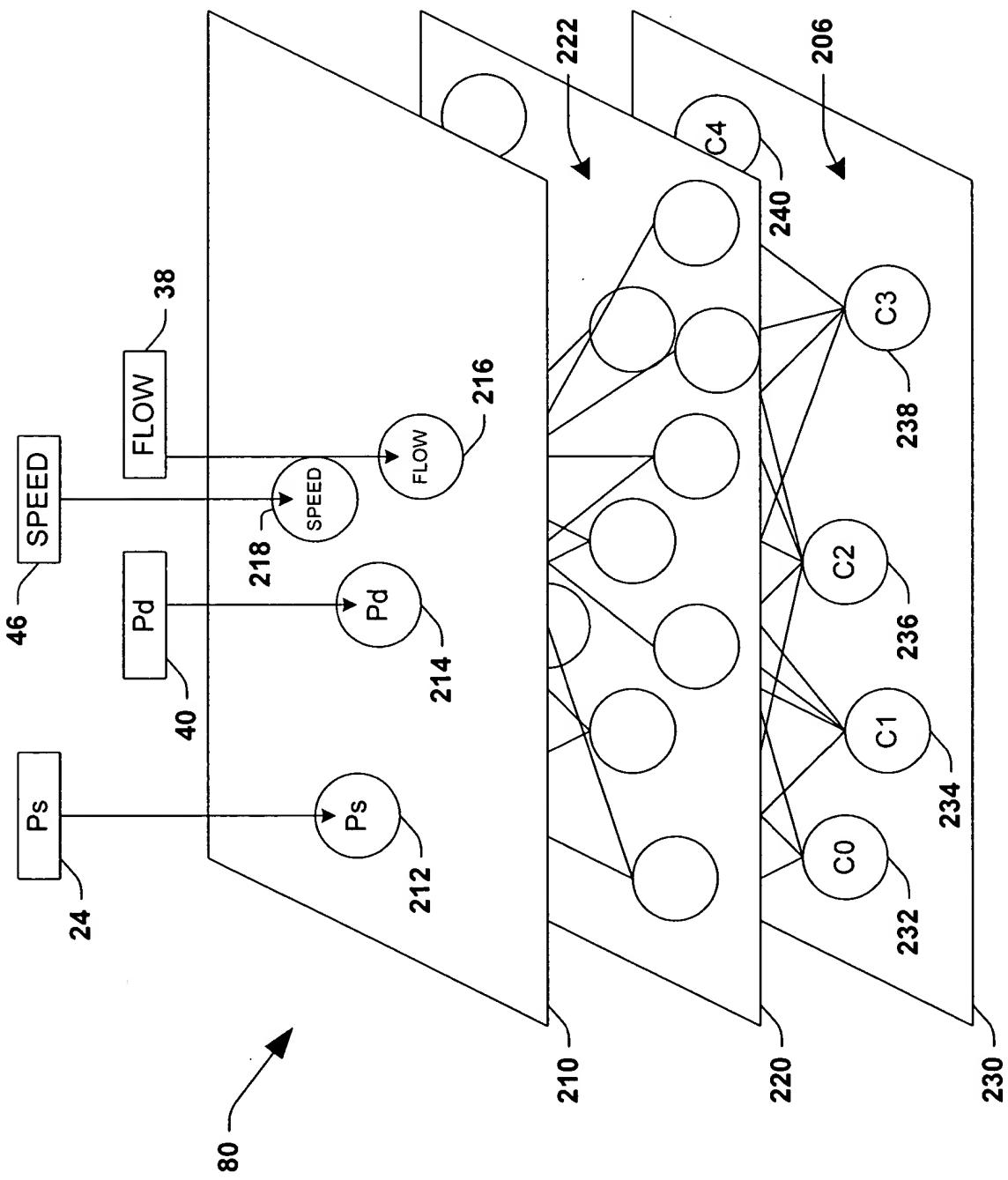


**FIG. 9**

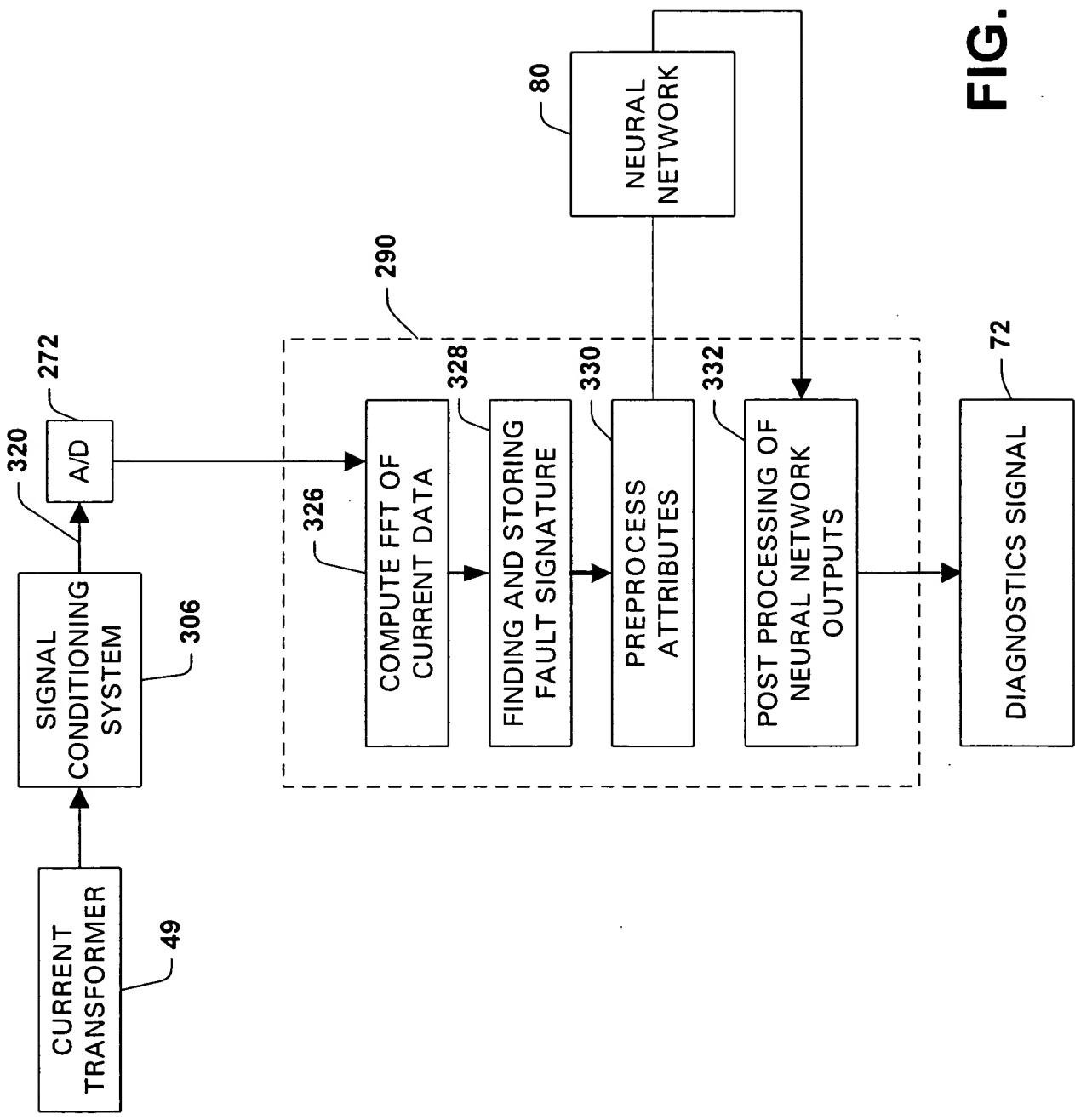
DIAGNOSTICS SIGNAL	
CLASS 0	normal; no cavitation
CLASS 1	incipient cavitation; mainly balance hole cavitation
CLASS 2	medium cavitation; mainly vane cavitation
CLASS 3	full cavitation; large amount of bubbles on the suction eye but no surging
CLASS 4	surging cavitation; full blown cavitation with surging

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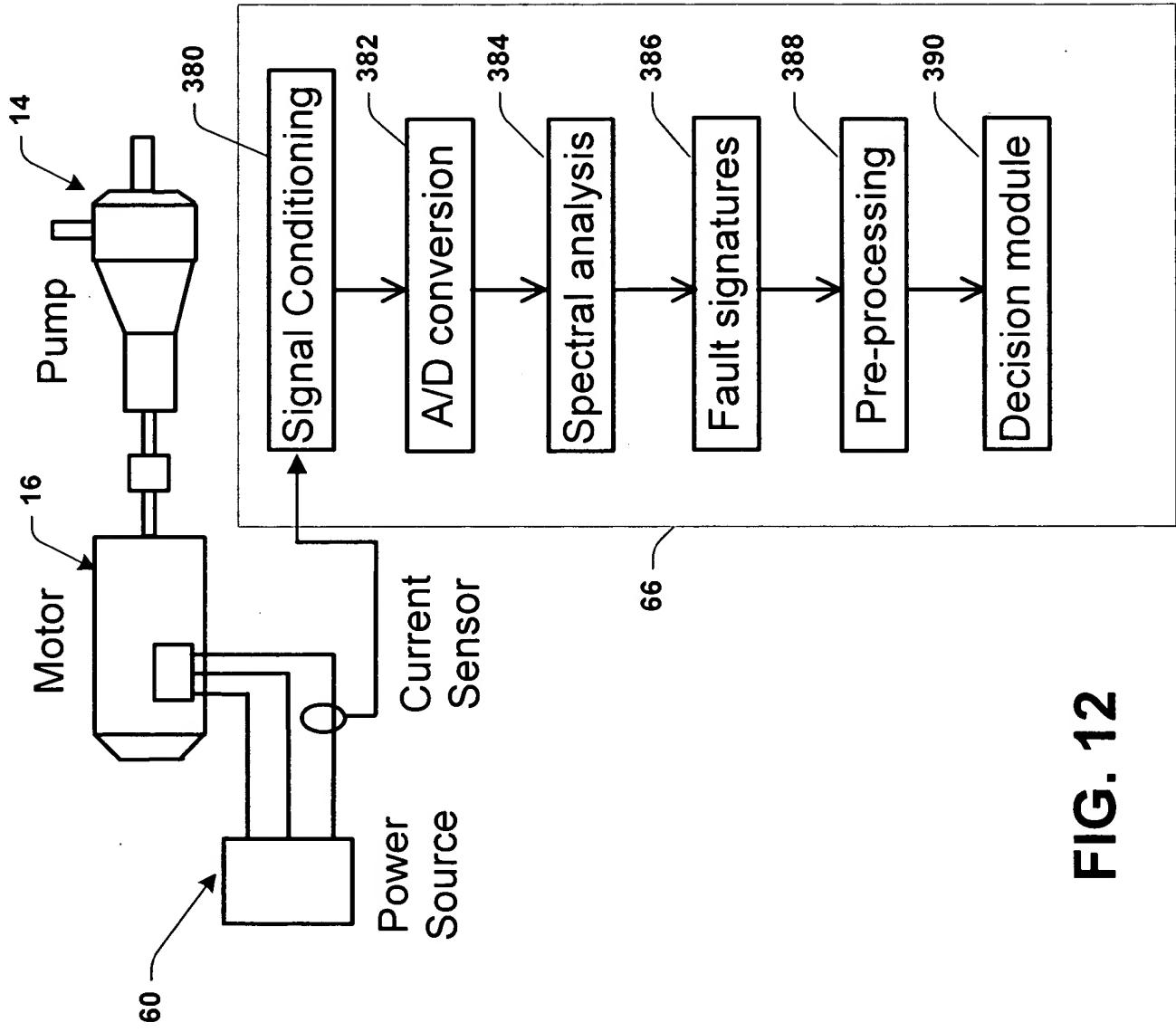
72



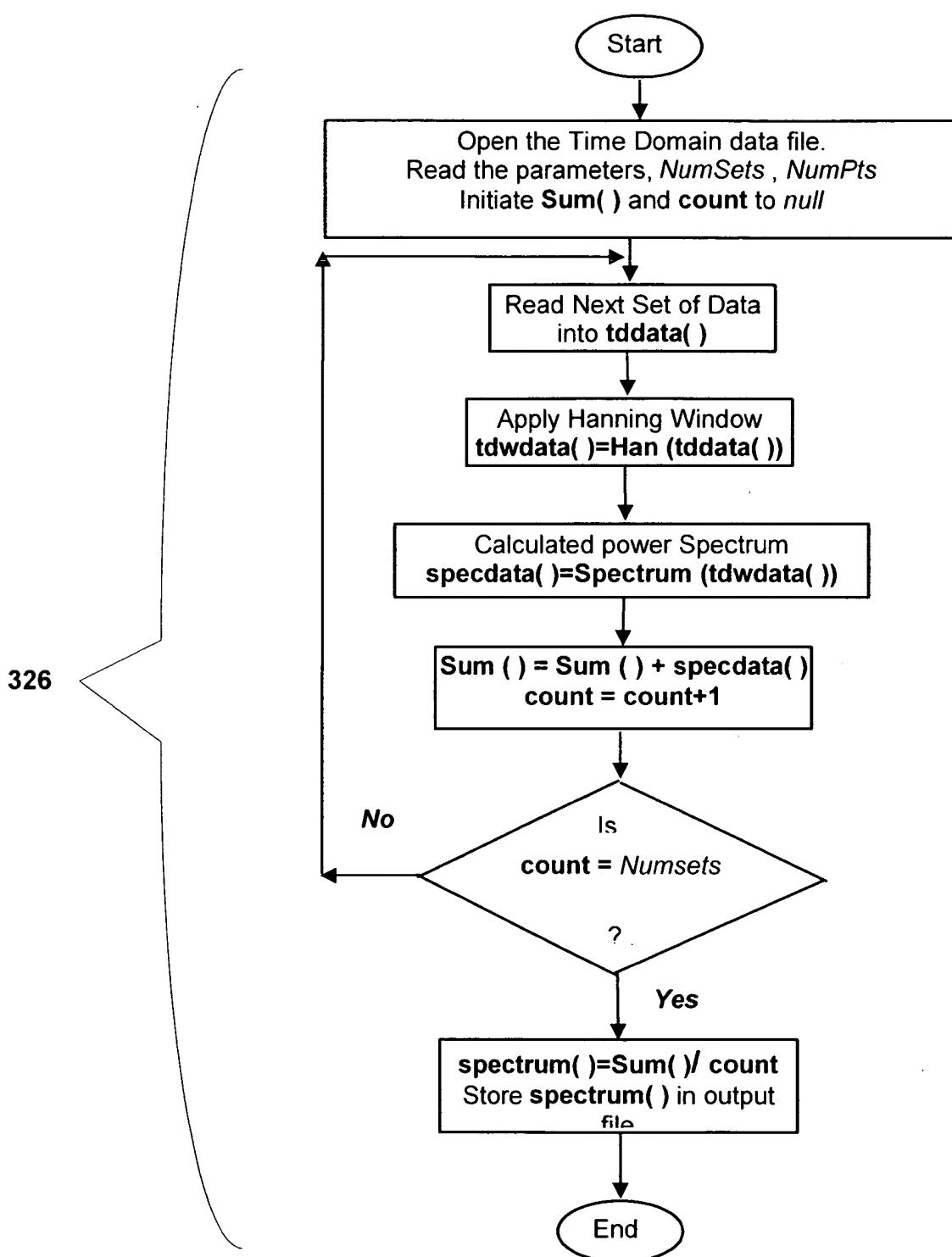
**FIG. 10**



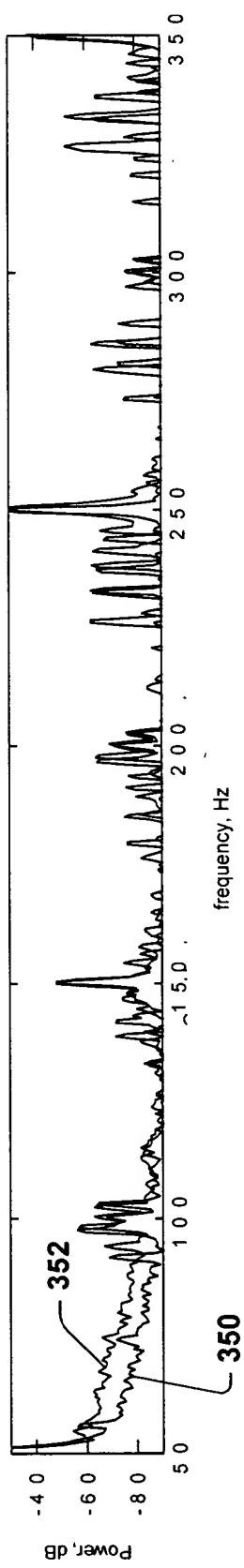
**FIG. 11**



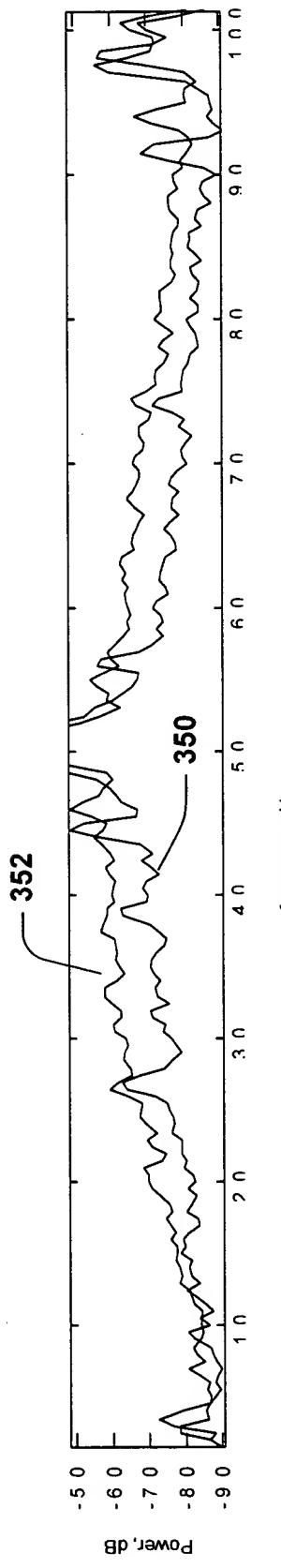
**FIG. 12**



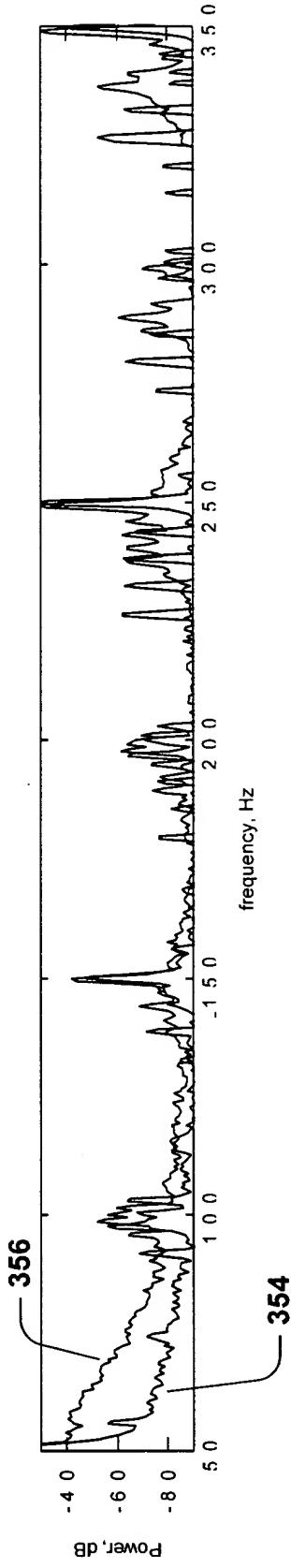
**FIG. 13**



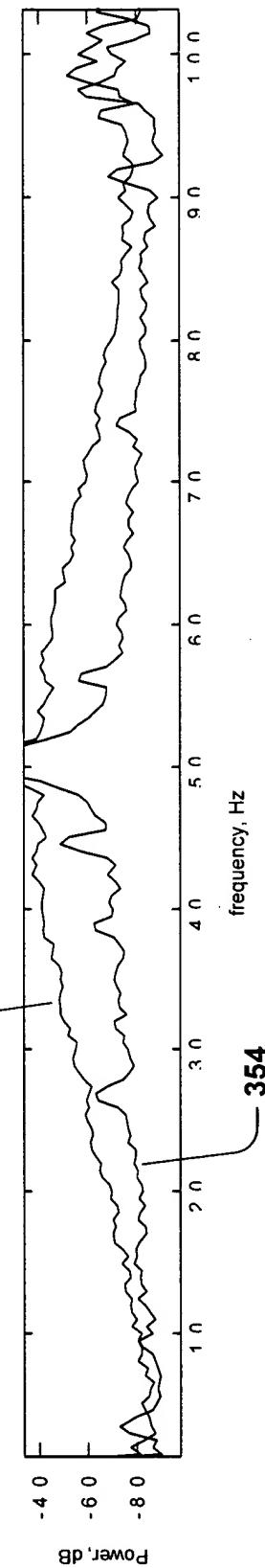
**Fig. 14a**



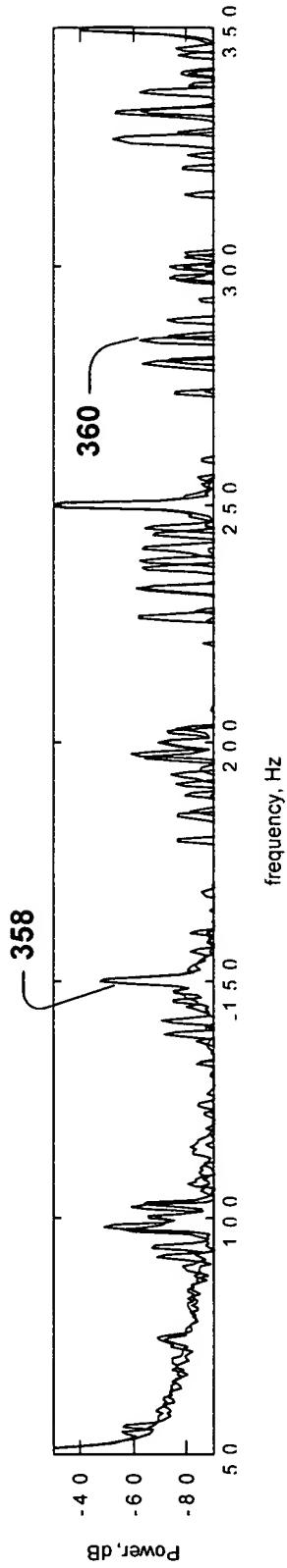
**Fig. 14b**



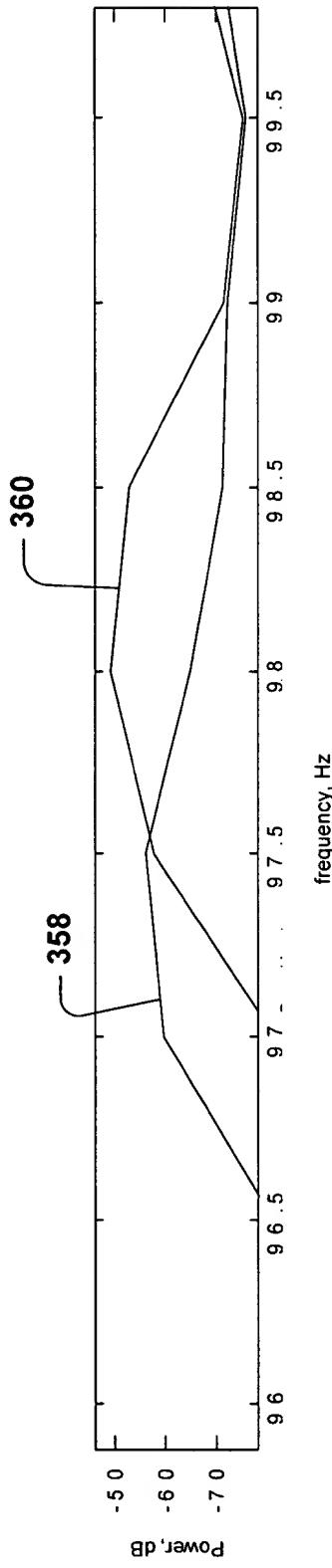
**Fig. 14c**



**Fig. 14d**



**Fig. 14e**



**Fig. 14f**

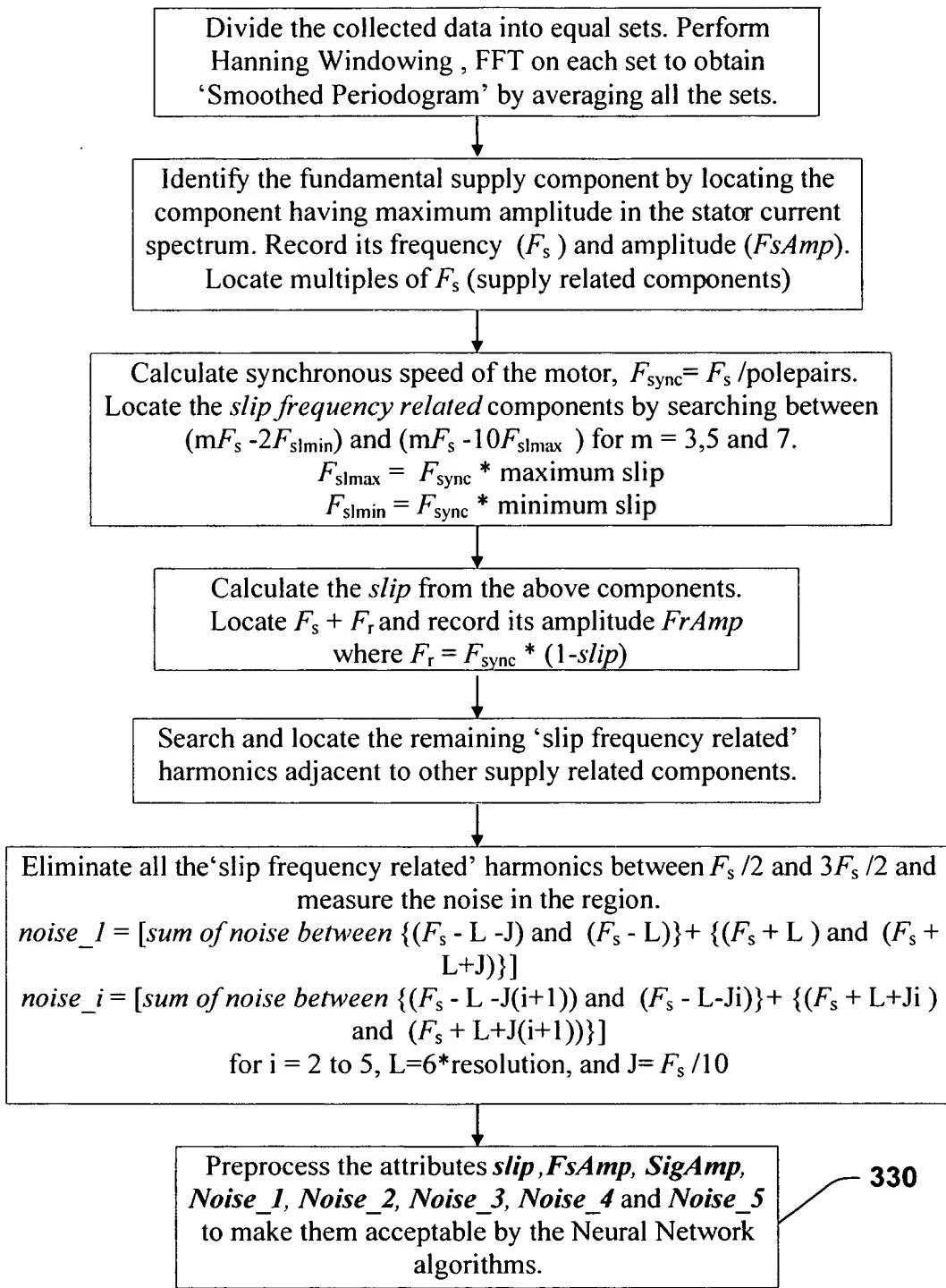
**FIG. 14g**

$f_0$	$f_1$	$f_2$	$f_3$	$f_4$	$\dots$	$f_n$
$A_{3}$	$A_{34}$	$A_{67}$	$A_{78}$	$A_{84}$	•	•
$A_{34}$	$A_{-68}$	$A_{-90}$	$A_{-65}$	$A_{45}$	•	•
$A_{56}$	$A_{45}$	$A_{56}$	$A_{78}$	•	•	$A_H$
$A_{-23}$	$A_{45}$	$A_7$	$A_{90}$	$A_{12}$	•	•
$A_{67}$	$A_{36}$	$A_3$	$A_{45}$	$A_{47}$	•	•
$A_{78}$	$A_{67}$	$A_{12}$	$A_{67}$	$A_{37}$	•	•
$A_{234}$	$A_{27}$	$A_{478}$	$A_{24}$	$A_{127}$	•	•
$A_{-98}$	$A_{78}$	$A_{26}$	$A_{12}$	$A_{128}$	•	•
$A_{26}$	$A_{96}$	$A_{83}$	$A_{56}$	$A_{234}$	•	•
$A_4$	$A_{32}$	$A_{187}$	$A_{56}$	$A_{34}$	•	•
$A_0$	$A_{16}$	$A_{73}$	$A_{76}$	$A_{33}$	•	•
$A_{75}$	$A_{17}$	$A_{45}$	$A_{69}$	$A_{44}$	•	•

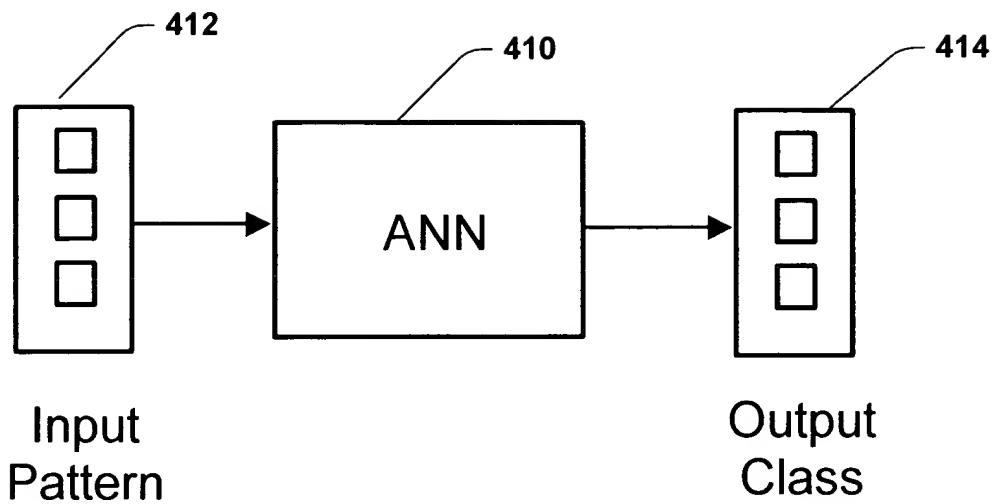
↙ 400

↙ 402

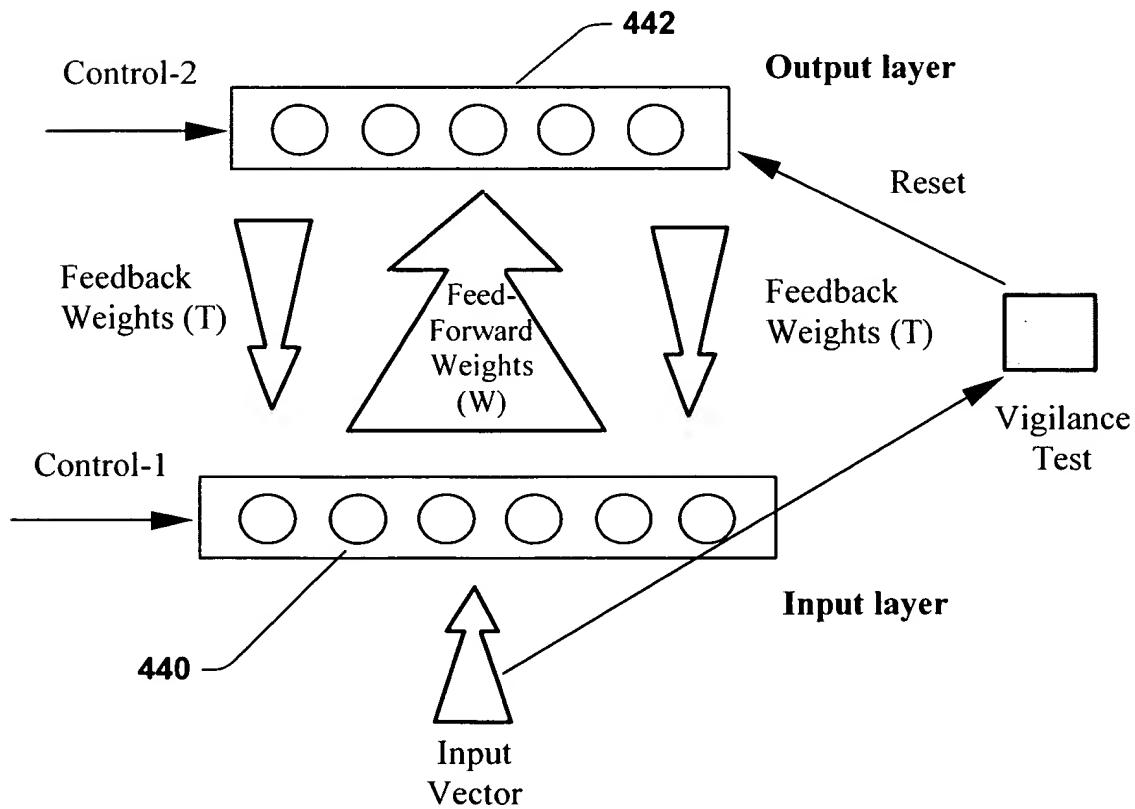
↙ 404



**FIG. 15**

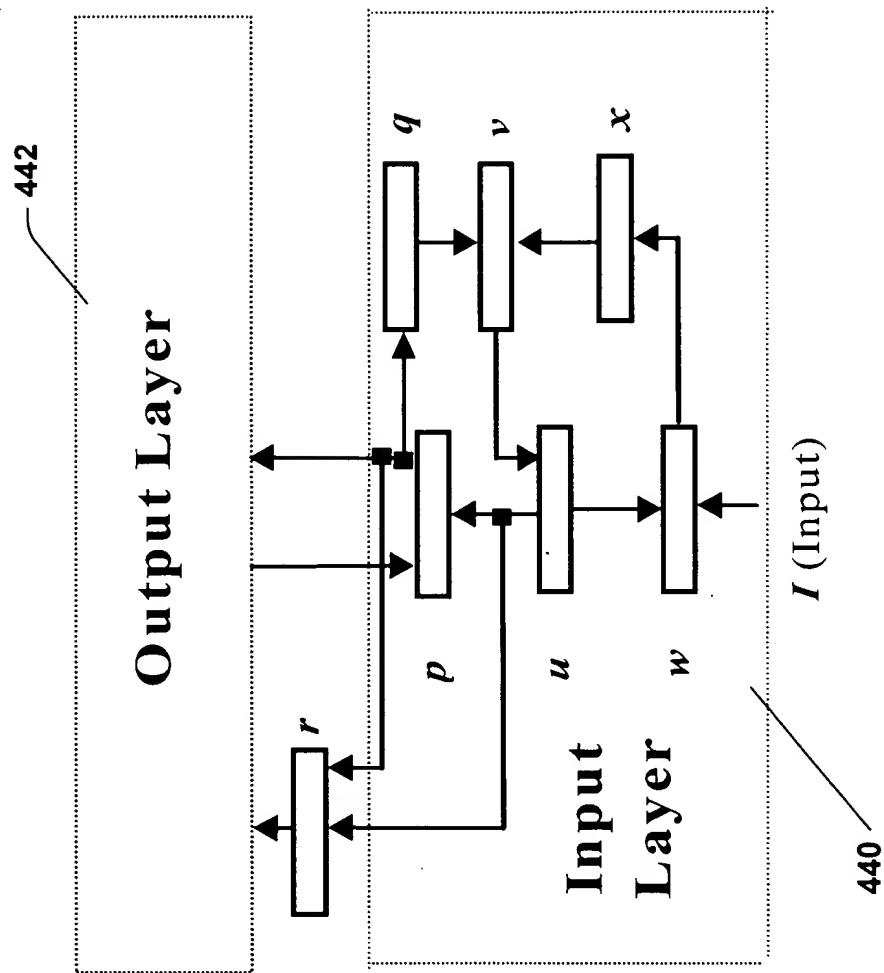


**Fig. 16**



**Fig. 17**

**Fig. 18**



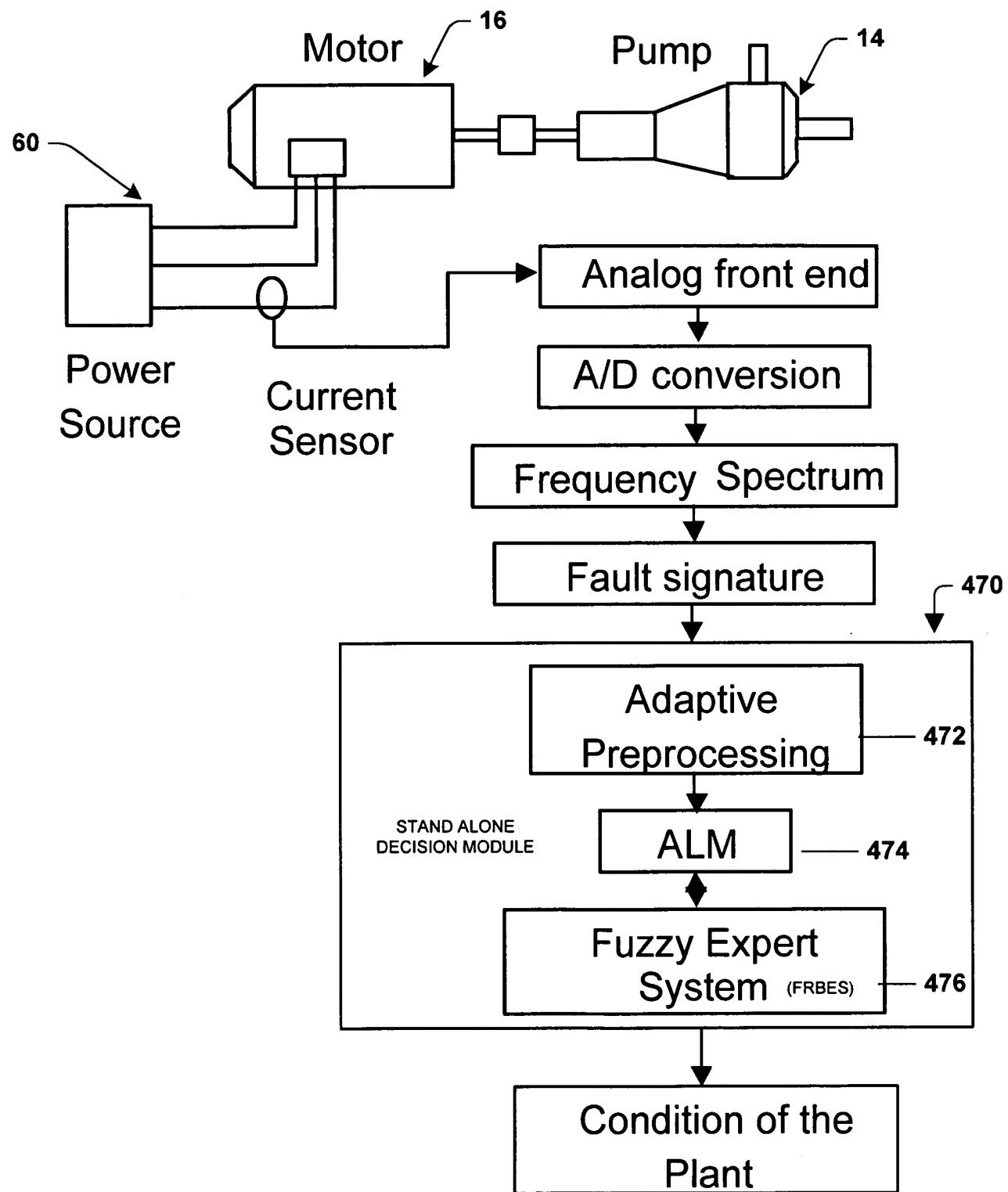


Fig. 19

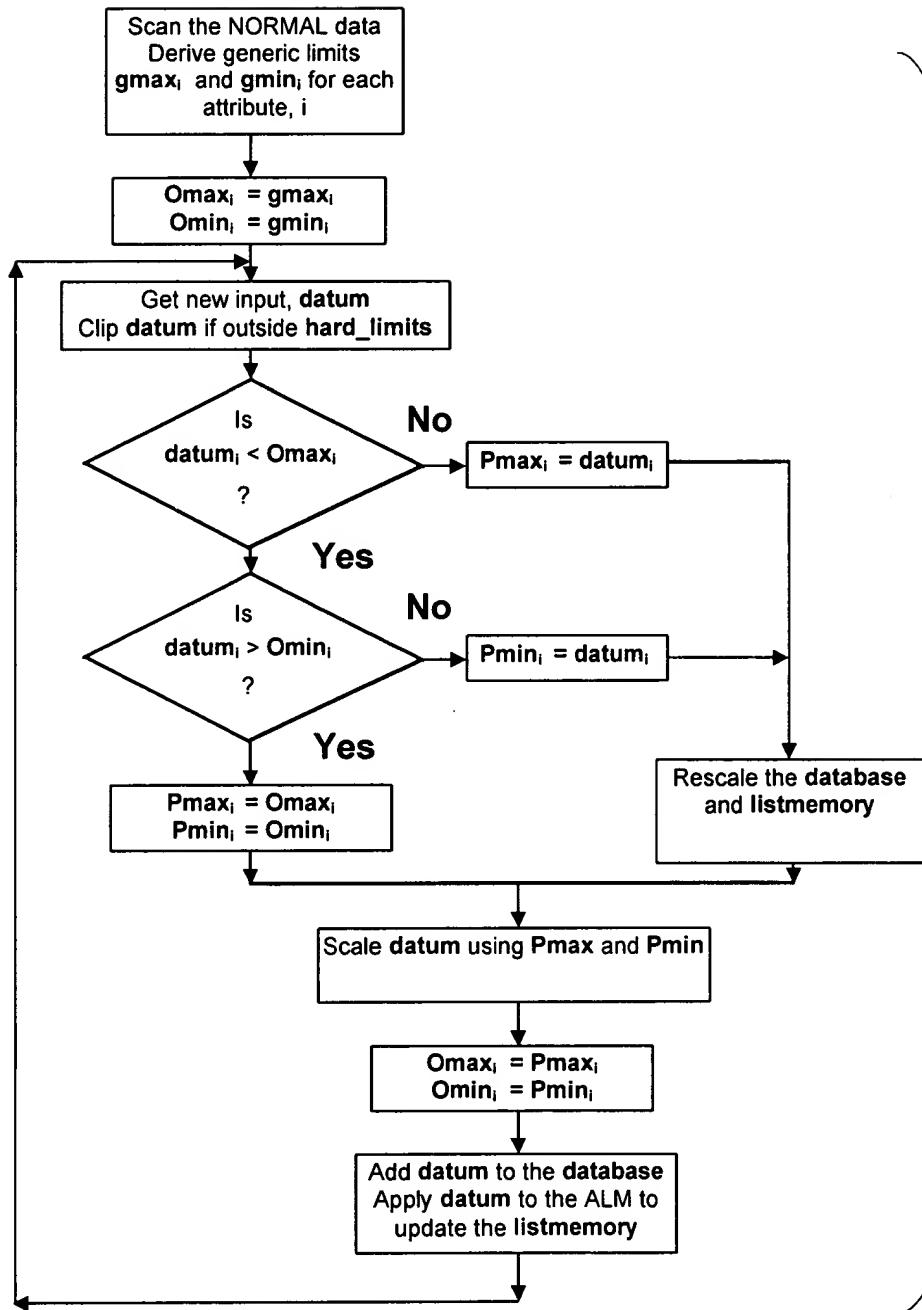
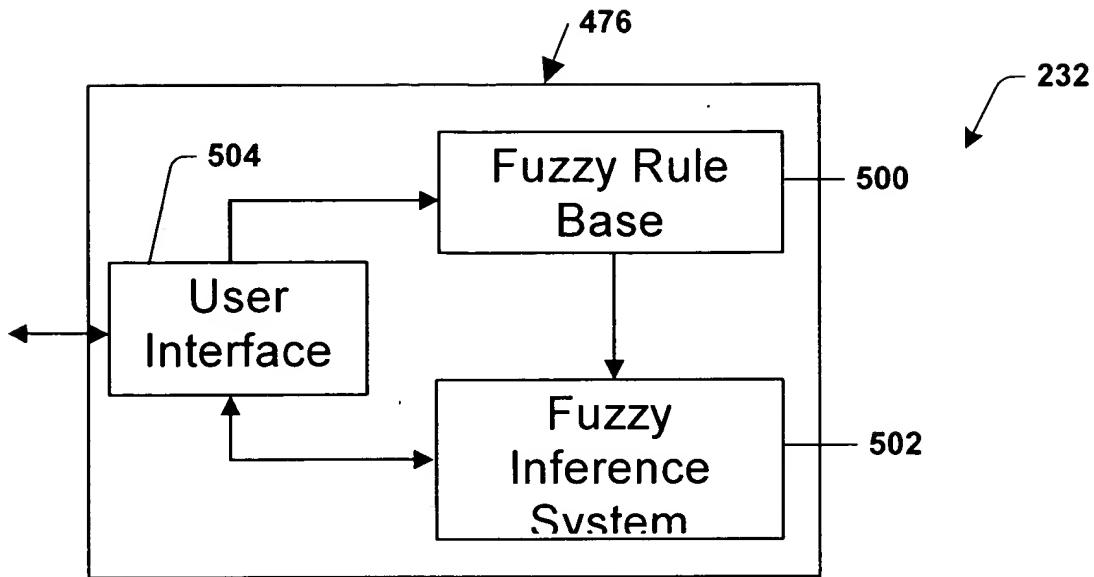
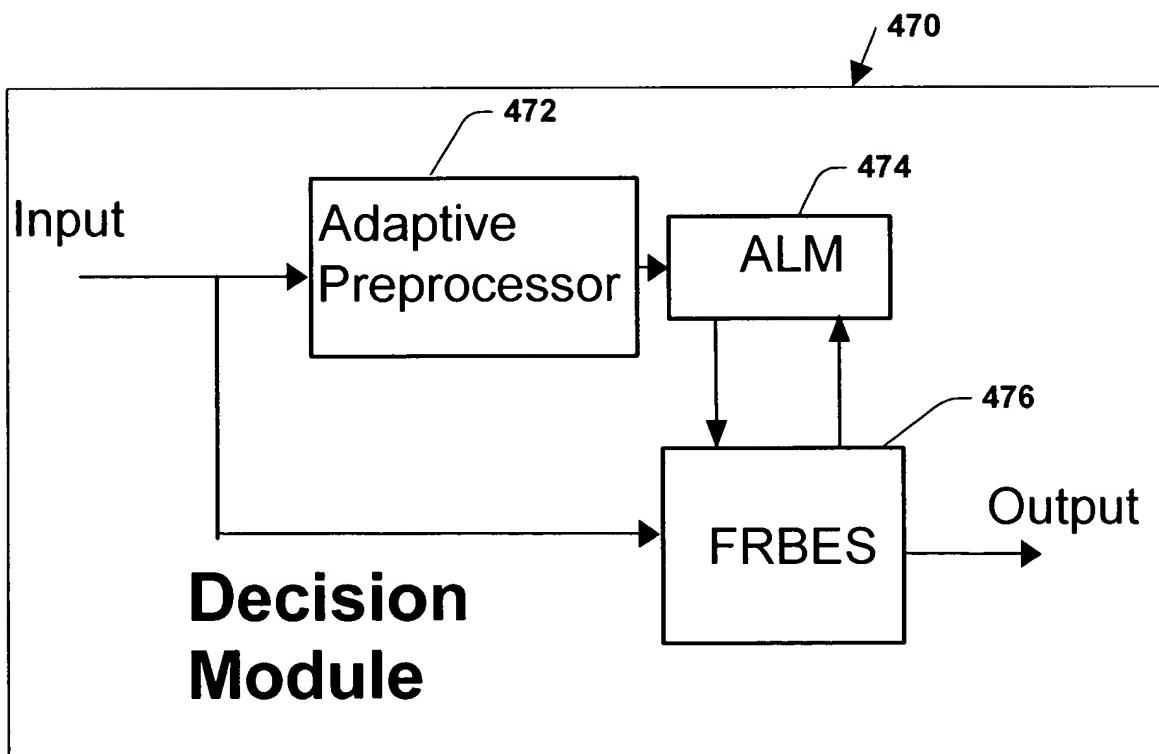


Fig. 20



**Fig. 21**



**Fig. 22**

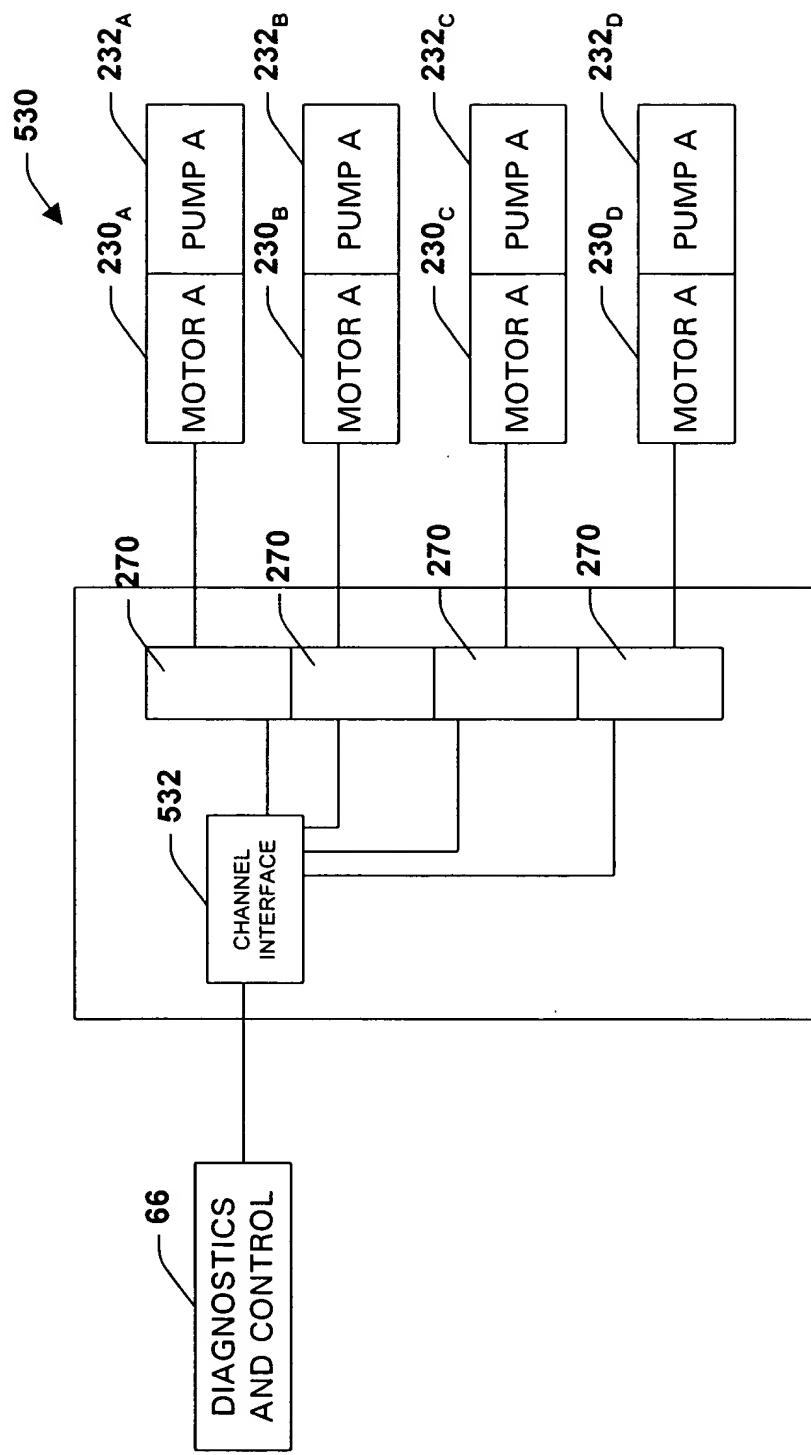
```

IF all the attributes are NORMAL THEN condition is normal
IF slip is SLL0 and noise_2 is H/ THEN condition is low-cav
IF noise_4 and noise_5 are VERH/ THEN condition is sev-cav
  IF noise_4 and noise_5 are H/ THEN condition is sev-cav
    IF FsAmp is SLL0 and noise_5 are SLH/ THEN condition is sev-cav
      IF FsAmp is LO and noise_5 is SLH/ THEN condition is sev-cav
      IF FsAmp is VERLO and noise_5 is SLH/ THEN condition is sev-cav
      IF FsAmp is SLLO and noise_4 are H/ THEN condition is sev-cav
        IF FsAmp is LO and noise_4 is H/ THEN condition is sev-cav
        IF FsAmp is LO and noise_4 is VERH/ THEN condition is sev-cav
      IF FsAmp is SLL0 and noise_4 is NORMAL and noise_5 is NORMAL THEN condition is low-block
        IF FsAmp is LO and noise_4 is NORMAL and noise_5 is NORMAL THEN condition is sev-block
          IF slip and FsAmp are VERLO THEN condition is sev-block
            IF FFAmp is H/ THEN condition is impel-fault
            IF framp is VERH/ THEN condition is impel-fault

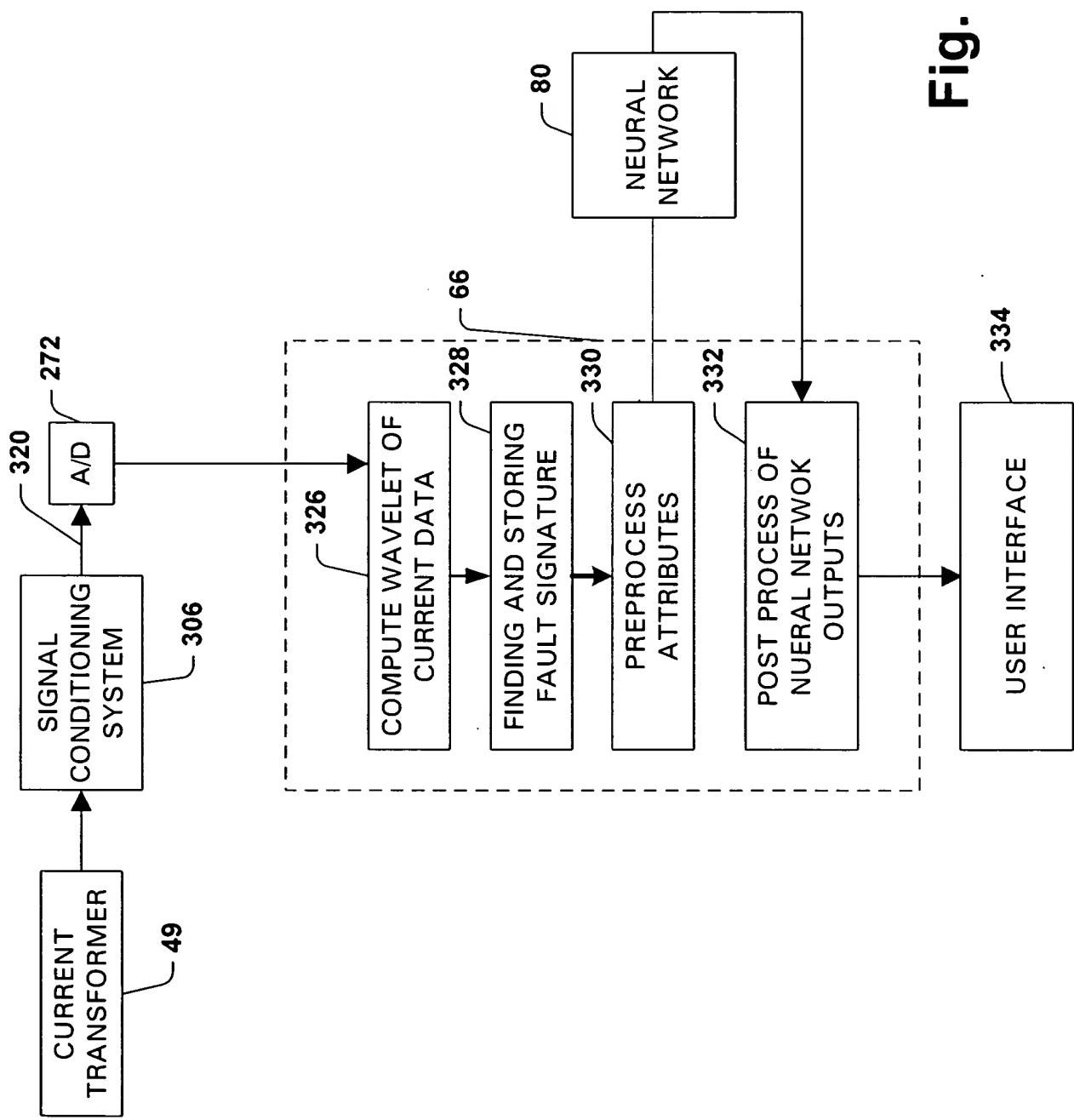
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**Fig. 23**

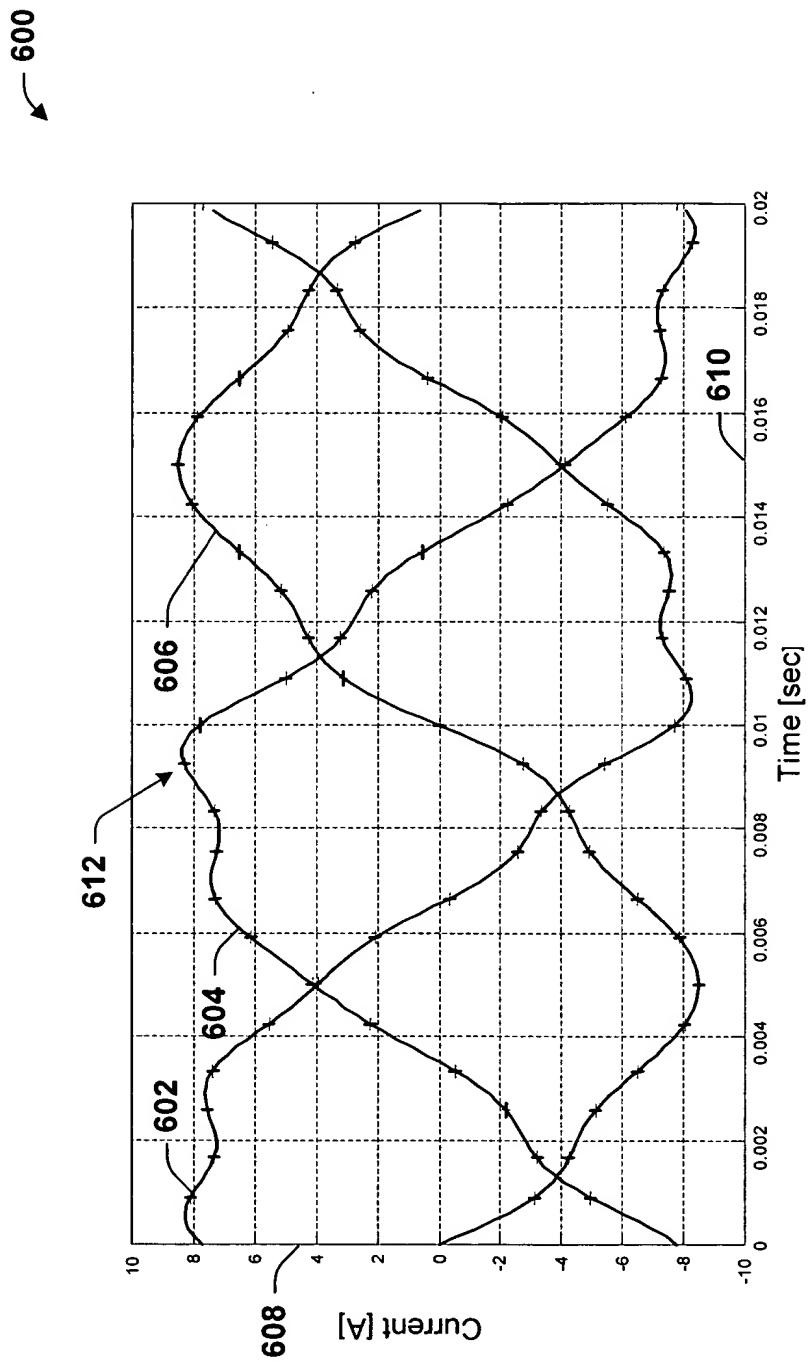
**Fig. 24**



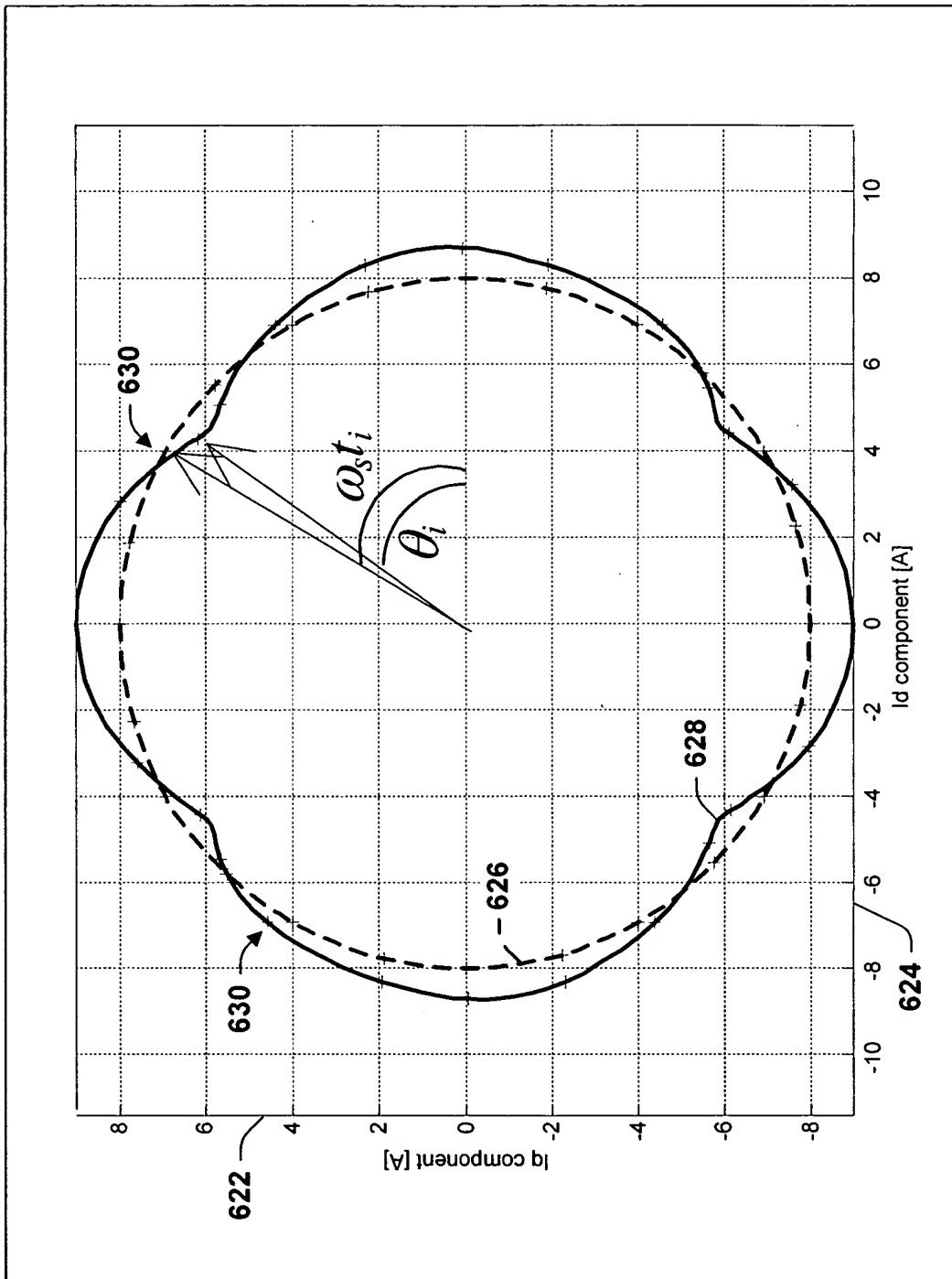
**Fig. 25**



**FIG. 26**



**FIG. 27**



620

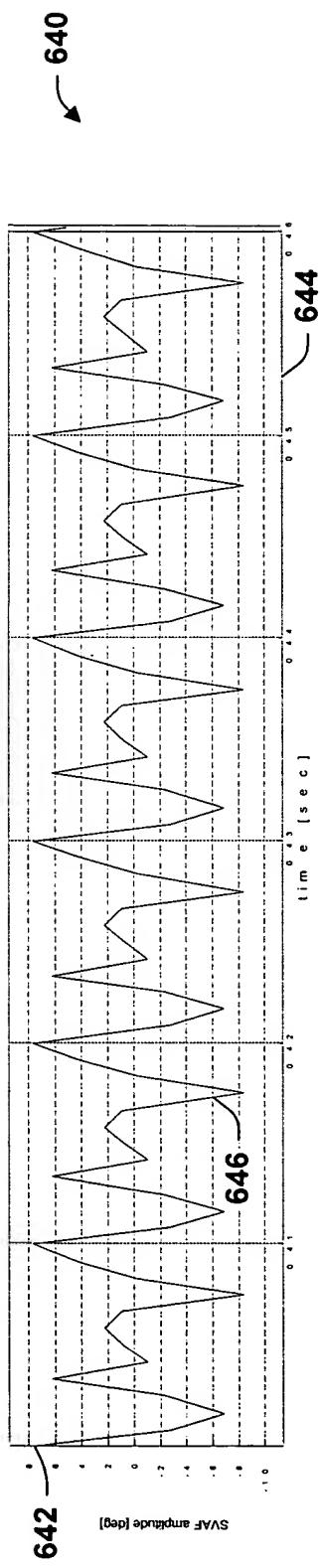


FIG. 28

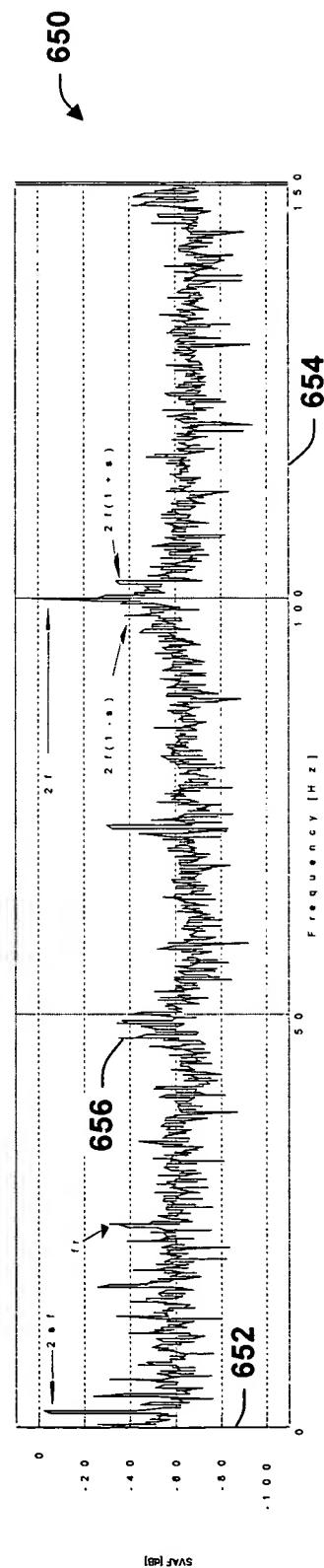
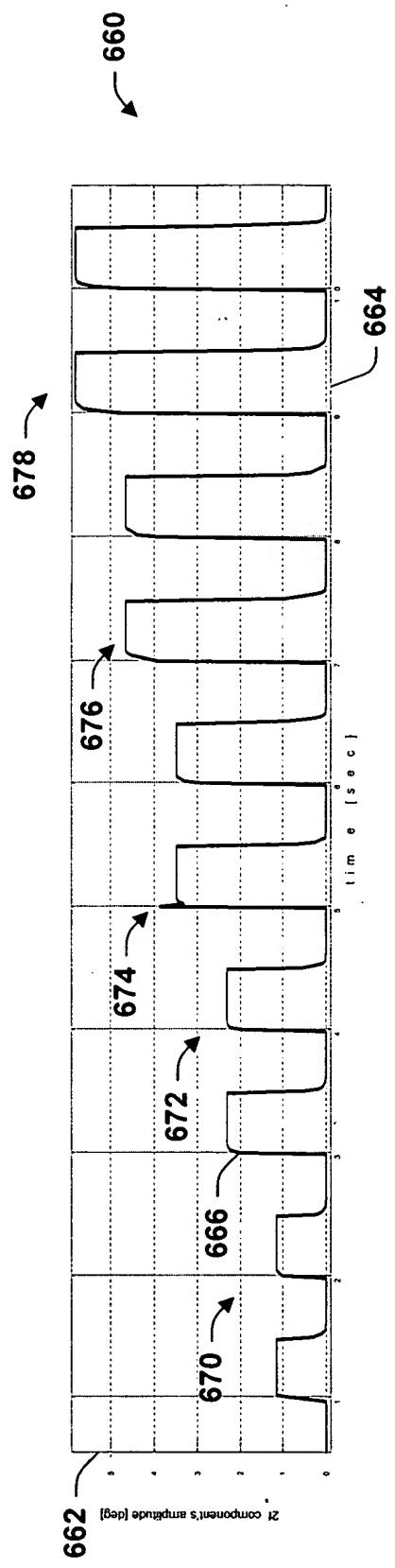
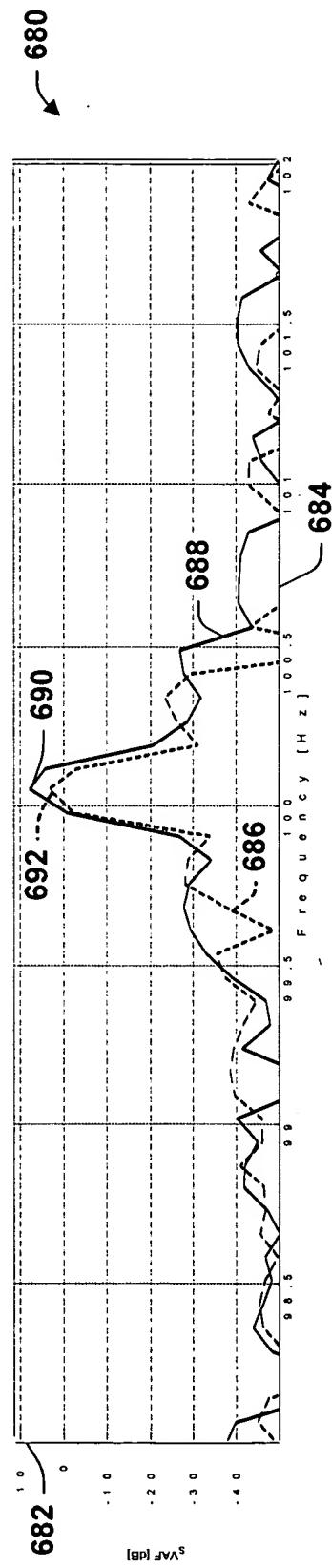


FIG. 29

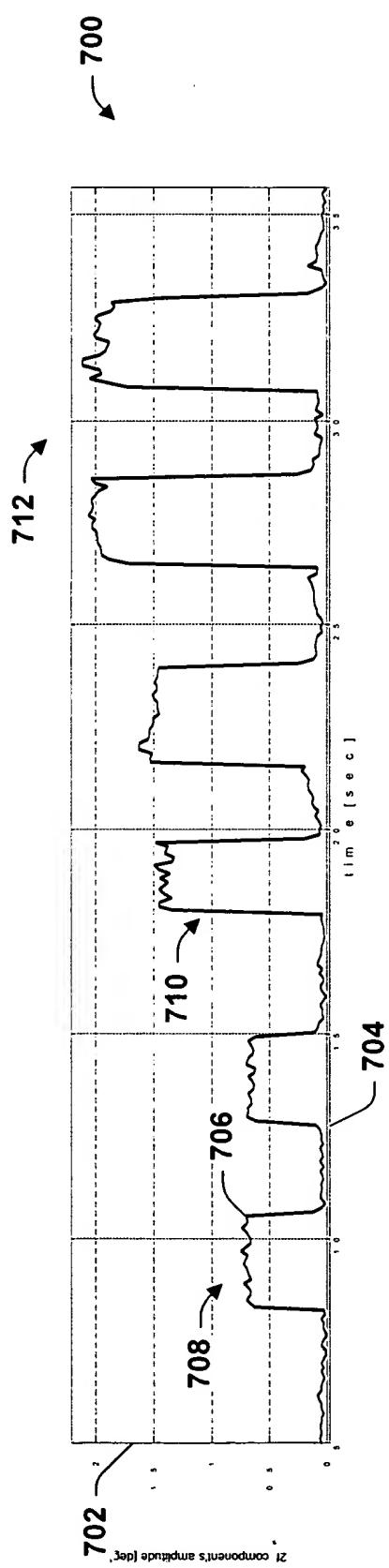


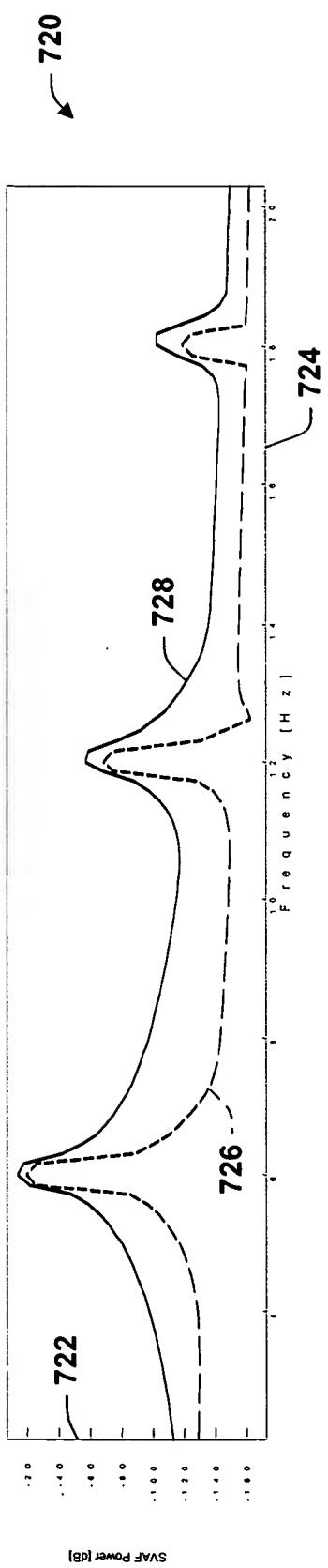
**FIG. 30**



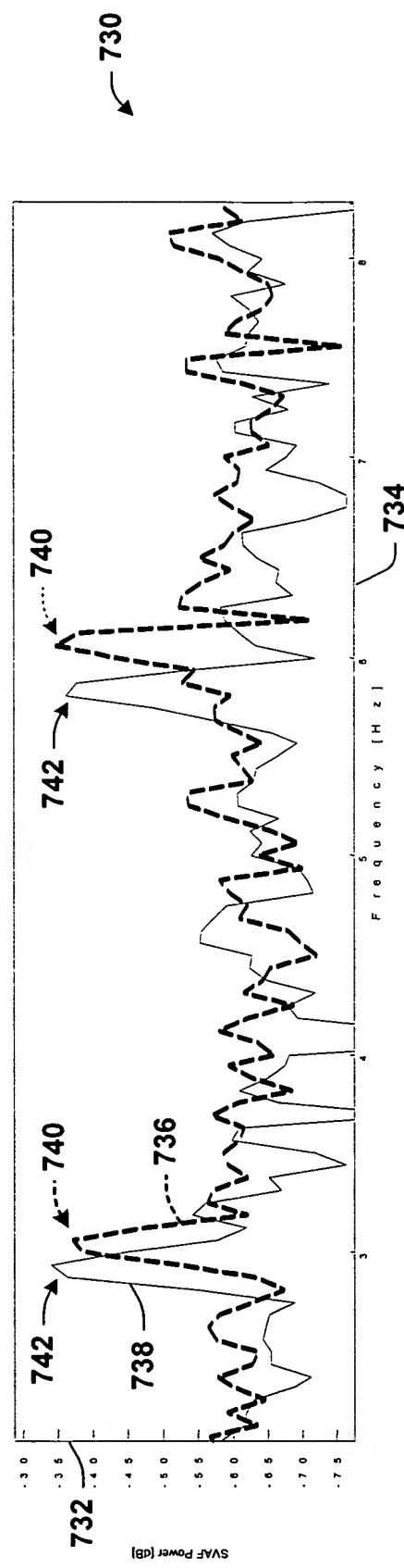
**FIG. 31**

**FIG. 32**





**FIG. 33**



**FIG. 34**

750  
752  
758  
756  
754

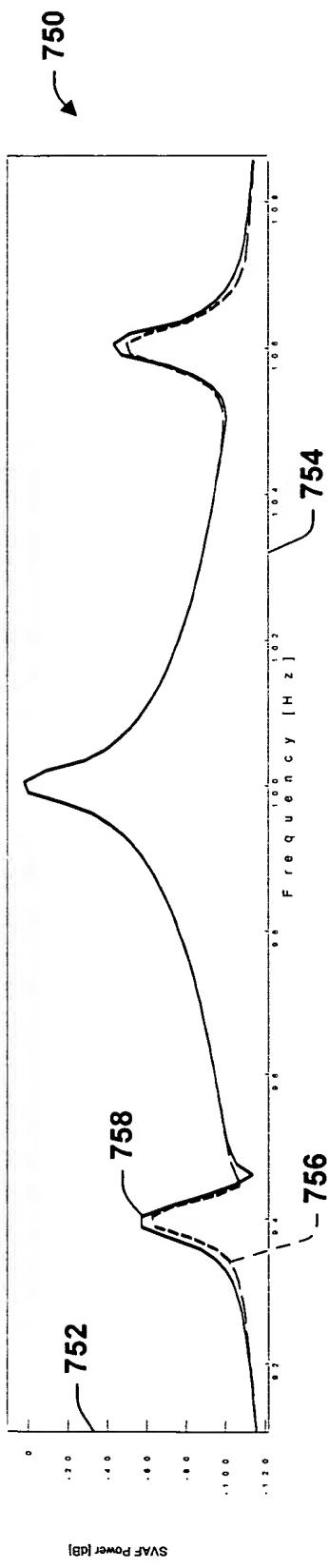


FIG. 35

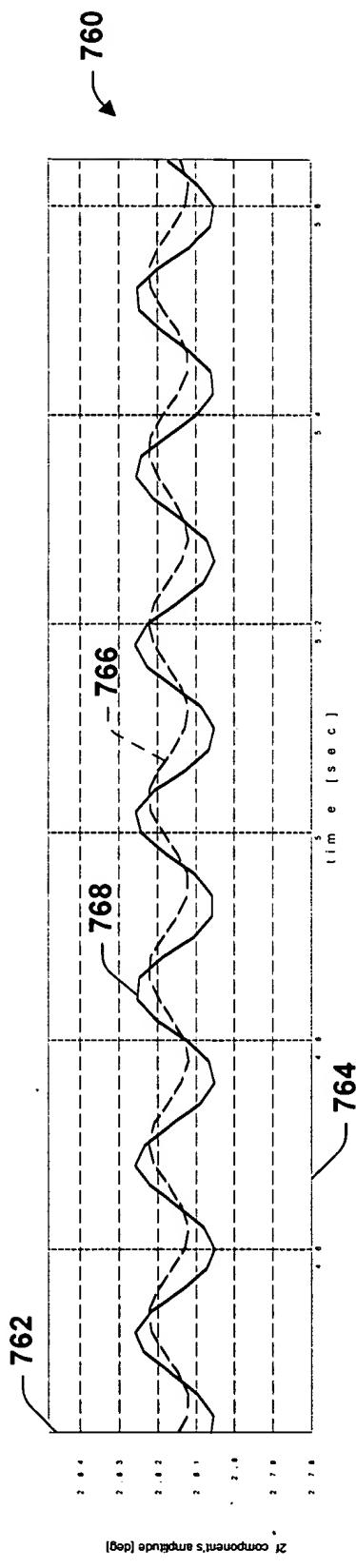
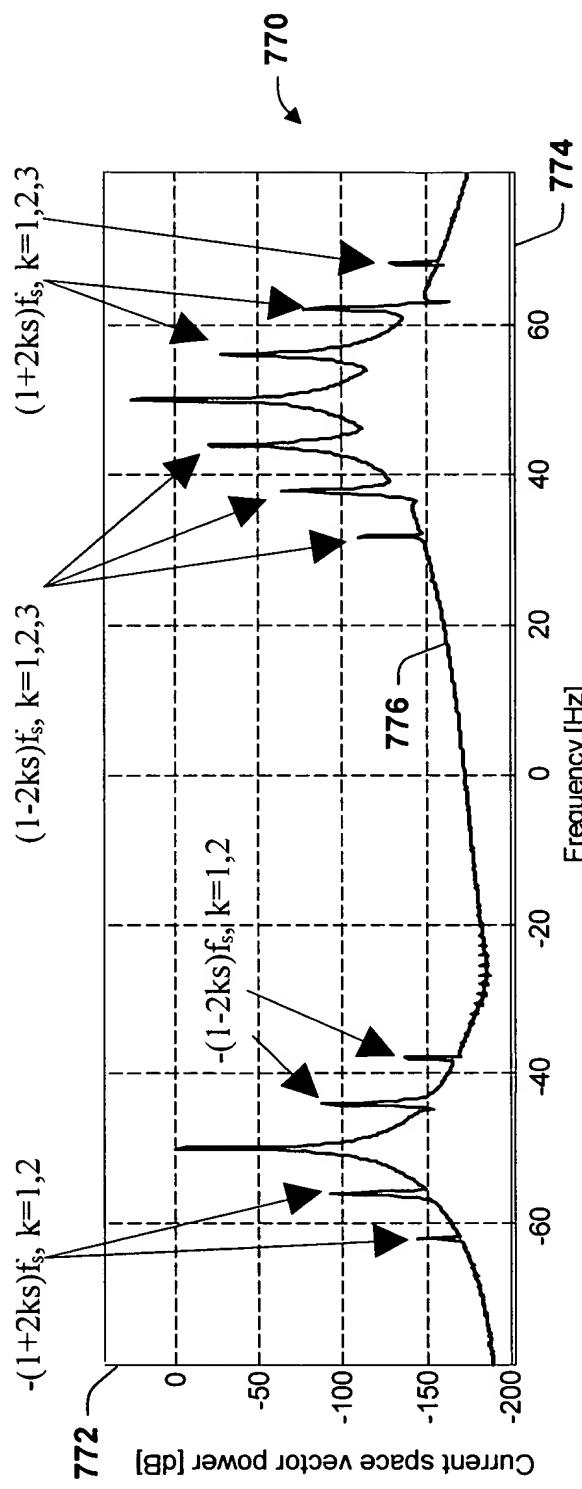
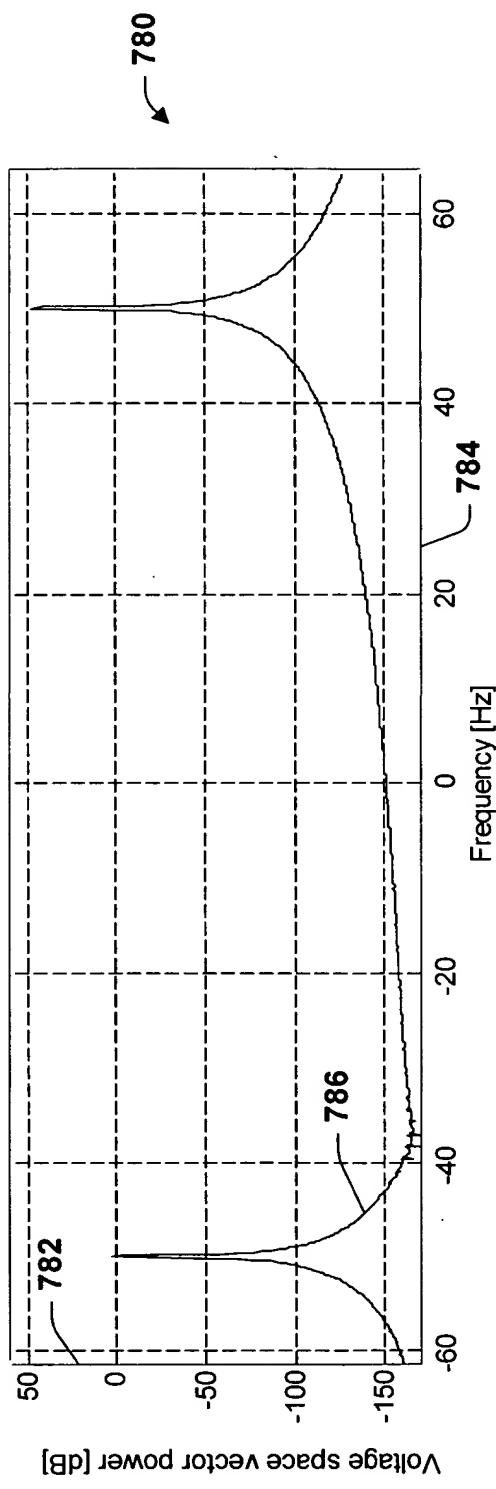


FIG. 36



**FIG. 37**



**FIG. 38**

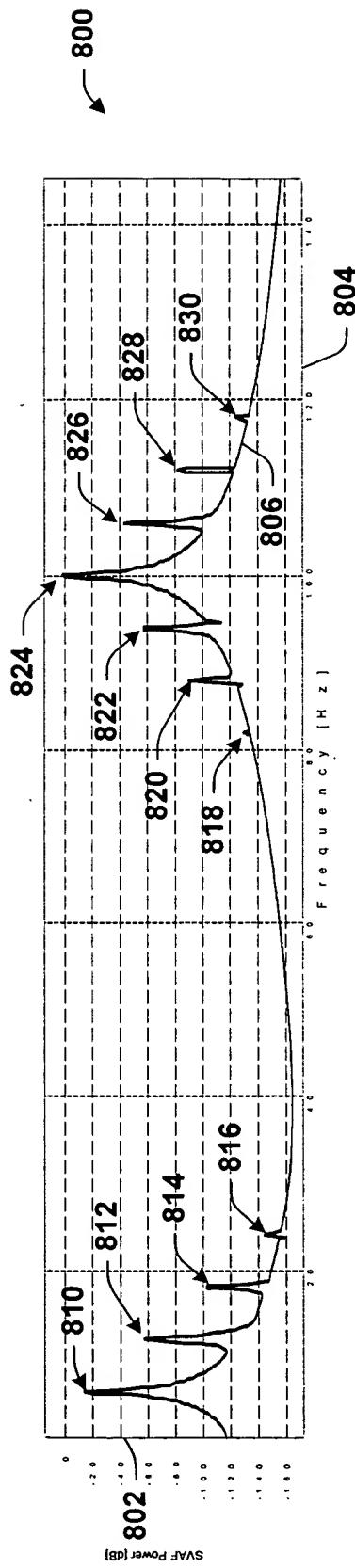


FIG. 39

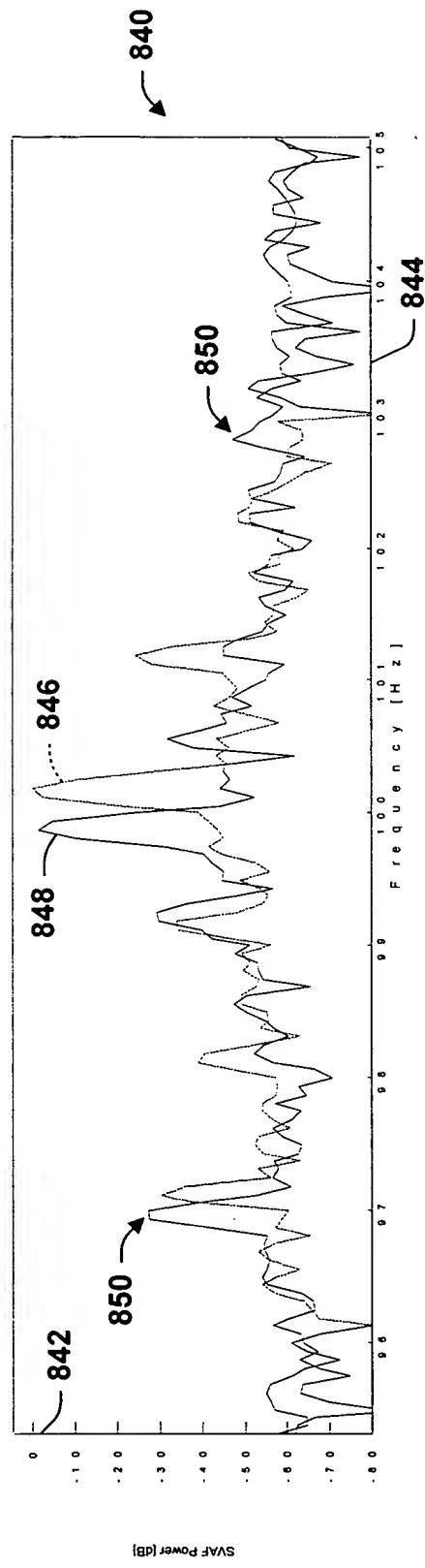
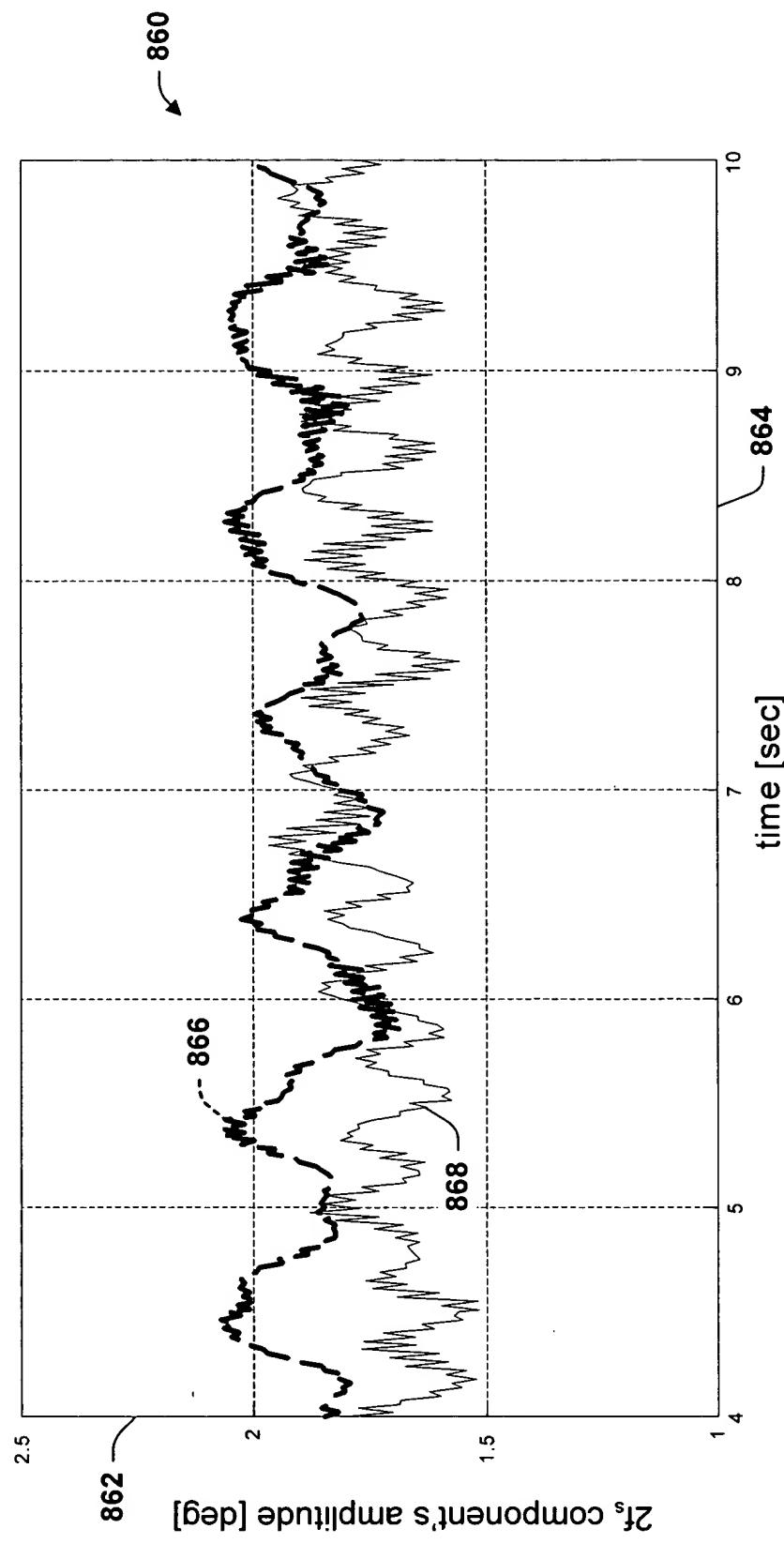
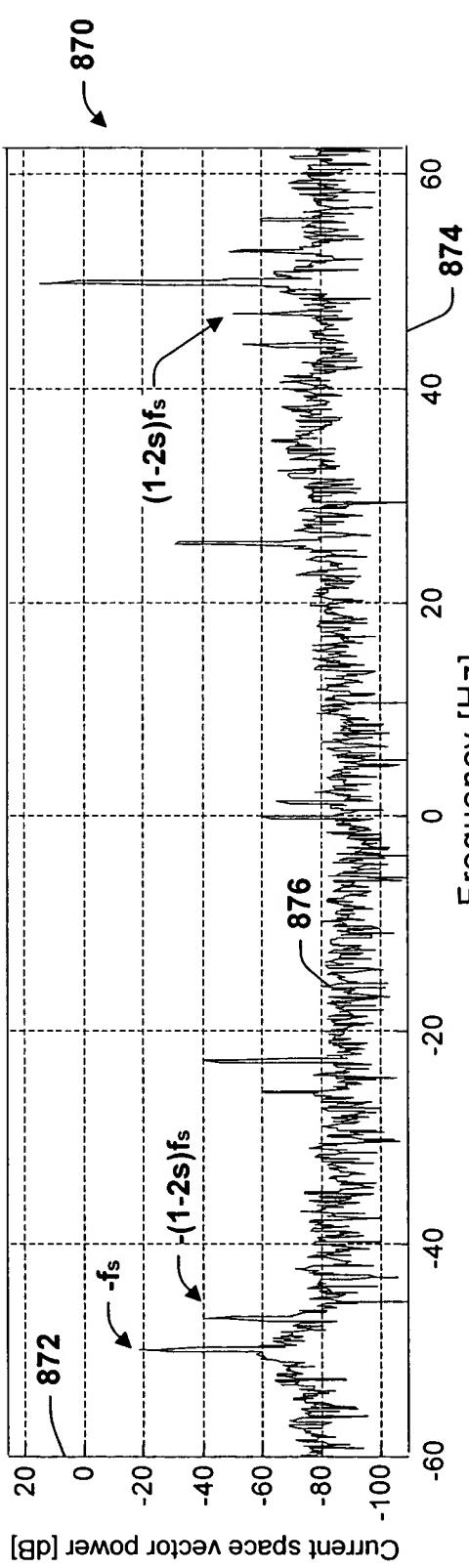


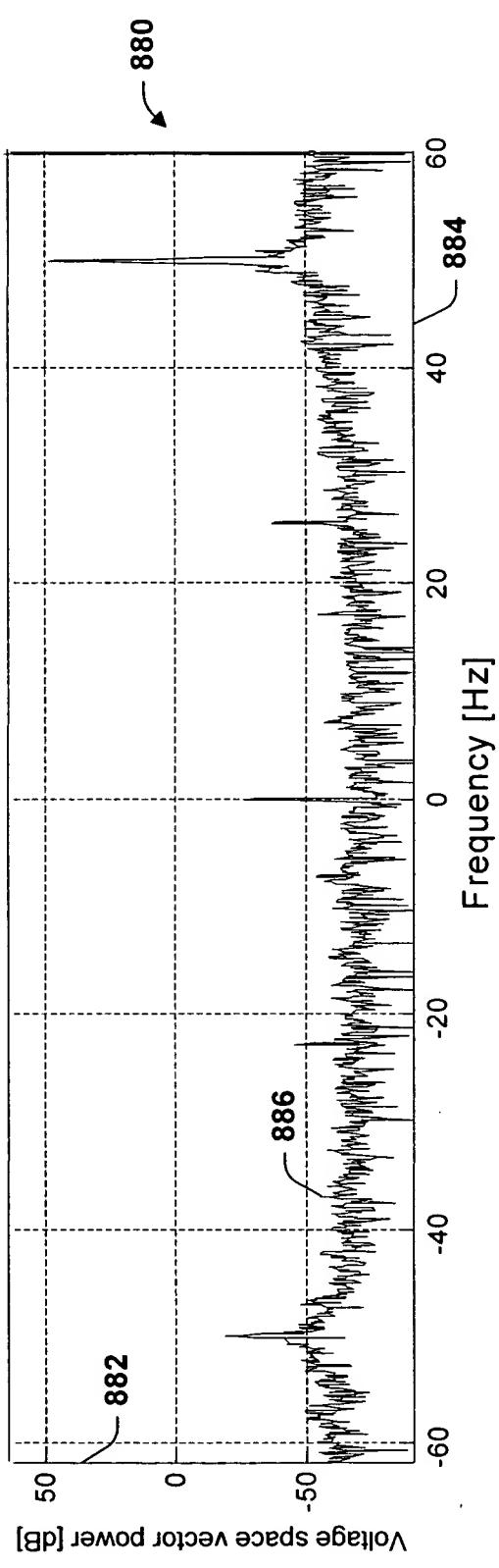
FIG. 40

**FIG. 41**





**FIG. 42**



**FIG. 43**

**FIG. 44**

